Paulson-Cheek Mechanical
6145 Northbelt Parkway
Suite F
Norcross, GA 30071
Ga. Reg. 000386
770. 729. 0076
770. 729. 1076 Fax

Medline Wildcat II – Lines 7&8

Lithia Springs, GA

HVAC Submittal

June 18, 2015

General Contractor:	Alston Construction
Mechanical Engineer:	Paulson-Cheek Mechaical, Inc.
Mechanical Contractor:	Paulson-Cheek Mechanical, Inc.

Section 1	Rooftop Units
Section 2	Air Compressors
Section 3	Grilles, Registers, & Diffusers
Section 4	Gravity Ventilator Hoods with Motorized Dampers
Section 5	Roof Exhaust Fan
Section 6	Roof Curbs
Section 7	Drop Box Diffuser
Section 8	Wall Intake Louvers
Section 9	Gas-Fired Unit Heater
Section 10	Desiccant Dryers
Section 11	Humidifiers

HVAC Submittal Cover Sheet

SECTION: 1
PRODUCT: Rooftop Units

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Trane
SUPPLIER:	Trane
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

REVISED Submittal

Prepared For:
Paulson Cheek Mechanical
Attn: Danny Brooks
6145 Northbelt Parkway
Norcross, GA 30071

Sold To:
Paulson Cheek Mechanical

Date: *May 05, 2015*

Job Name:
Medline - Area II Production Line

Trane U.S. Inc. is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
6	Packaged Rooftop, Cooling / Heating Units

Notes:

1. Fire/smoke devices, external isolation, spare filters/belts are not included by Trane.

Sincerely,

Becky Warner Sanborn, LEED AP
Account Manager

Trane U.S. Inc. *- Ingersoll Rand*
Office: 678-775-4202 Cell: 404-226-6954
Email: becky.sanborn@trane.com
www.trane.com

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

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Packaged Rooftop, Cooling / Heating Units 22

Tag Data - Packaged Rooftop, Cooling / Heating Units (Qty: 6)

Item	Tag(s)	Qty	Description	Model Number
A1	50 TON	5	50 Ton Voy III	YCD600B4H-1B4ND2-BC-E---0K0-00R-0-------XA--*
A2	30 TON	1	30 Ton Voy III	YCD360B4L-1B1CD2-BC-E---0K0-00R-0-------XA--*

Product Data - Packaged Rooftop, Cooling / Heating Units

All Units

Dx Cooling with Natural Gas Heat
Downflow Supply and Upflow Return
460 Volt 60 Hertz 3 Phase
Barometric Relief
2" MERV 8 High Efficiency, Throwaway Filter
0-100% Economizer, Reference Enthalpy Control
Constant Volume - discharge temp control
Thru-The-Base Electrical Provision
Non-Fused Disconnect Switch
Field Powered Ground Fault Convenience Outlet
Lontalk communication interface
Standard efficiency unit
Clogged filter switch
Flat Roof Curb (Fld)
Room sensor with temperature adjustment and override (Fld)
5 year Compressor Parts Warranty
Start Up by Trane Service Team
1 Year Labor Warranty Whole Unit by Trane Service Team

Item: A1 Qty: 5 Tag(s): 50 TON

50 ton 60 Hertz
High Heat
20 Hp Supply Motor
725/604 (60/50 hz) Supply Fan Drive

Item: A2 Qty: 1 Tag(s): 30 TON

30 ton 60 Hertz
Low Heat
7.5 Hp Supply Motor
650/541 (60/50 hz) Supply Fan Drive

Performance Data - Packaged Rooftop, Cooling / Heating Units

Tags	50 TON	30 TON
Leaving coil DB (F)	60.69	59.34
Leaving coil WB (F)	59.67	57.78
Design airflow (cfm)	20000	12000
Cooling EDB (F)	83.50	80.00
Cooling EWB (F)	69.00	67.00
Ambient temp (F)	95.00	95.00
Ent air relative humidity (%)	48.32	51.08
Cooling LDB (F)	63.44	61.33
Cooling LWB (F)	60.67	58.53
Gross total capacity (MBh)	606.53	348.52
Gross sensible capacity (MBh)	494.06	270.84
Gross latent capacity (MBh)	112.48	77.68
Net total capacity (MBh)	555.77	326.56
Net sensible capacity (MBh)	443.30	248.88
Net sensible heat ratio (%)	79.76	76.21
Input htg capacity (MBh)	800.00	350.00
Output htg capacity (MBh)	648.00	283.00
Heating EAT (F)	70.00	70.00
Heating LAT (F)	100.30	92.20
Heating delta T (F)	30.30	22.20
ESP (in H2O)	1.000	1.000
Actual Supply Motor BHP (hp)	18.333	7.414
Supply Motor Power (kW) (rpm)	707	654
Indoor motor power (kW)	14.87	6.43
Outdoor motor power (kW)	4.26	3.37
Compressor power (kW)	41.15	24.46
System power (kW)	60.28	34.26
EER @ AHRI (EER)	10.3	10.3
IEER @ AHRI (EER)	10.9	12.0
IPLV @ AHRI (IPLV)	10.5	12.6
Minimum circuit ampacity (A)	119.07	71.65
Maximum overcurrent protection (A)	125.00	90.00
Minimum disconnect switch size (A)	129.00	75.00
Compressor 1 RLA (A)	23.00	23.00
Compressor 2 RLA (A)	23.00	23.00
Compressor 3 RLA (A)	27.50	0.00
Supply fan FLA (A)	24.70	9.40
Condenser fan FLA (A)	3.50	3.50
Condenser fan count (Each)	4.00	3.00
Exhaust fan FLA (A)	0.00	0.00
Exhaust fan count (Each)	0.00	0.00
Electric heater FLA (A)	0.00	0.00
Crankcase heater FLA (A)	1.0	1.0
Min. unit operating weight (lb)	4905.0	3695.0
Max. unit operating weight (lb)	6925.0	5760.0
Fan motor heat (MBh)	50.76	21.96
HFCF-410A refrigerant charge - circuit 1 (lb)	20.0	29.3
HFCF-410A refrigerant charge - circuit 2 (lb)	38.8	-

Mechanical Specifications - Packaged Rooftop, Cooling / Heating Units
Item: A1, A2 Qty: 6 Tag(s): 50 TON, 30 TON

General R-410A
The units shall be downflow, horizontal, or mixed airflow. The operating range shall be between 115°F and 0°F in cooling as standard from the factory for all units. Cooling performance shall be rated in accordance with ARI testing procedures. All units shall be factory assembled, internally wired, fully charged with R-410A refrigerant and 100% run tested to check cooling operation, fan and blower rotation and control sequence before leaving the factory. Wiring internal to the unit shall be numbered for simplified identification. Units shall be UL listed to U.S. and Canadian safety standards.

Compressors R410A
The Trane 3-DTM Scroll compressors have a simple mechanical design with only three major moving parts. Scroll type compression provides inherently low vibration. The 3-D Scroll provides a completely enclosed compressor chamber with optimized scroll profiles which leads to increased efficiency. The 3-D Scroll includes a direct-drive, 3600 rpm, suction gas cooled hermetic motor. Dependent on the compressor model, motor protection is provided by either a patented motor cap and integral line break motor protector or an external 24 VAC module which provides protection against incorrect phase sequence, excess motor temperatures, over current protection, and phase loss. Trane 3-D compressor includes centrifugal oil pump, scroll tips seals, internal heat shield that lowers the heat transfer from discharge and suction gas, oil level sight glass and oil charge valve. Some compressor models also provide a dip tube that allows for oil draining, in addition to a low leakage internal discharge check valve to help prevent refrigerant migration. Each compressor shall have a crankcase heater installed, properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

Evaporator and Condenser Coils - R410A
Condenser coils shall have all Aluminum Microchannel coils. Evaporator coils shall be internally finned Copper tubes mechanically bonded to high performance Aluminum plate fins. All coils shall be leak tested at the factory to ensure pressure integrity. The evaporator coil is pressure tested to 450 psig and the condenser coil at 650 psig. All dual circuit evaporator coils shall be of intermingled configuration. Sloped condensate drain pans are standard.

Refrigerant Circuits
Each refrigerant circuit shall have independent thermostatic expansion devices, service pressure ports and refrigerant line filter driers factory-installed as standard. An area shall be provided for replacement suction line driers.

2" High Efficiency Filters - MERV 8
2" High Efficiency MERV 7 filters will be standard.

Indoor Fan, 60 Hz Supply Motor
Unit will have belt driven, forward curve, centrifugal fans with fixed motor sheaves. The supply fan motors will be circuit breaker protected. All 60 Hz supply fan motors meet the Energy Independence and Security Act of 2009 (EISA).

High/Low 2 Stage Gas Heat
The heating section shall have a drum and tube heat exchanger(s) design with primary and secondary surfaces of corrosion resistant aluminized steel or optional stainless steel. A forced combustion blower shall supply premixed fuel to a single burner ignited by a pilotless hot surface ignition system. In order to provide reliable operation, a regulated gas valve shall be used that requires blower operation to initiate gas flow. On an initial call for heat, the combustion blower shall purge the heat exchanger(s) 45 seconds before ignition. After three unsuccessful ignition attempts, the entire heating system shall be locked out until manually reset at the thermostat. Two stage gas heat units shall be suitable for use with natural gas or propane (field installed kit). Gas heat units comply with California requirements for low NOx emissions.

Controls
Unit shall be completely factory wired with necessary controls and terminal block for power wiring. Units shall provide an external location for mounting fused disconnect device. ReliaTel controls shall be provided for all 24 volt control functions. The resident control algorithms shall make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point and provides better building comfort. ReliaTel controls shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.

Phase and Voltage Monitor
Standard on all Voyager Commercial units. Protects 3-phase equipment from phase loss, phase reversal, and low voltage. Any fault condition will send the unit into an auto stop condition. cULus approved.

Outdoor Fans
The outdoor fan will be direct-drive statically and dynamically balanced, draw through in the vertical discharge position. The fan motors will be permanently lubricated and have built-in thermal overload protection.

Barometric Relief
The barometric relief damper shall provide a pressure operated damper for the purpose of space pressure equalization and be gravity closing to prohibit entrance of outside air during the equipment off cycle.

Through-The-Base Electrical Provision
An electrical service entrance shall be provided which allows access to route all high and low voltage electrical wiring inside the curb, through the bottom of the outdoor section of the unit and into the control box area.

Non-Fused Disconnect Switch
A factory installed non-fused disconnect switch with external handle shall be provided and shall satisfy NEC requirements for a service disconnect. The non-fused disconnect shall be mounted inside the unit control box.

Economizer with Reference Enthalpy Control
An economizer will be factory installed. The assembly includes: 0-100% fully modulating dampers, minimum position setting, preset linkage, wiring harness and reference enthalpy control.

LonTalk Communication Interface (LCI-R)
The field or factory-installed ReliaTel LonTalk Communication Interface (LCI-R) will be provided to interface with the Trane Integrated Comfort System or LonTalk capable third party building management networks. The LCI-R will allow control and monitoring of the rooftop unit via a two-wire communication link.

Discharge Air Sensing
Provides true discharge air sensing in heating and cooling models. This sensor is a status indicator readable through Tracer, Tracker or LCI-R.

GFI Convenience Outlet (Field Powered)
A 15A, 115V Ground Fault Interrupter convenience outlet shall be factory installed and shall be powered by customer provided 115V circuit.

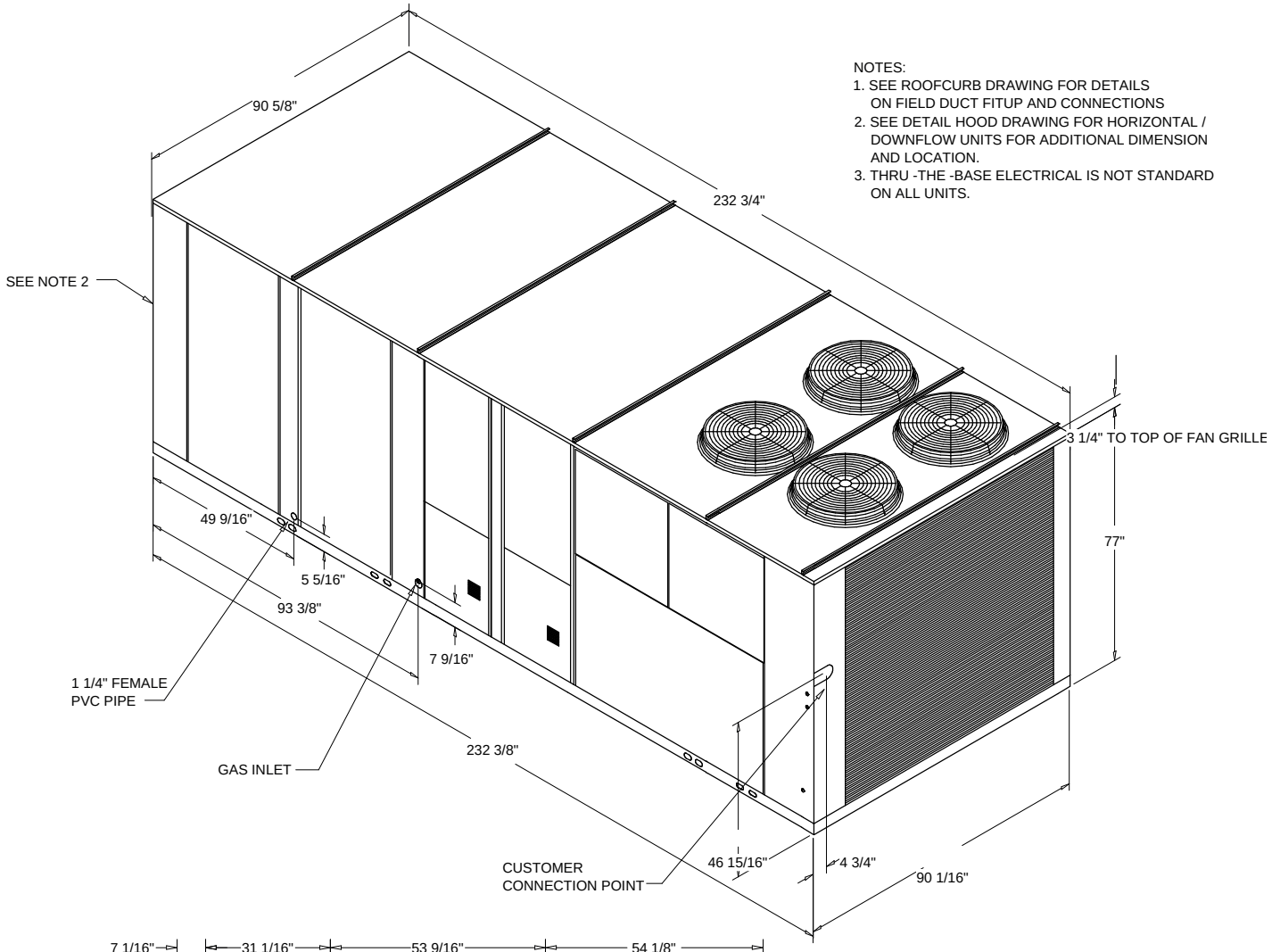
Clogged Filter Indication
This optional factory installed differential pressure switch allows dirty filter indication at the zone sensor with service LED. When closed, the dirty filter witch will light the service LED on the zone sensor and allow the unit to continue normal operation.

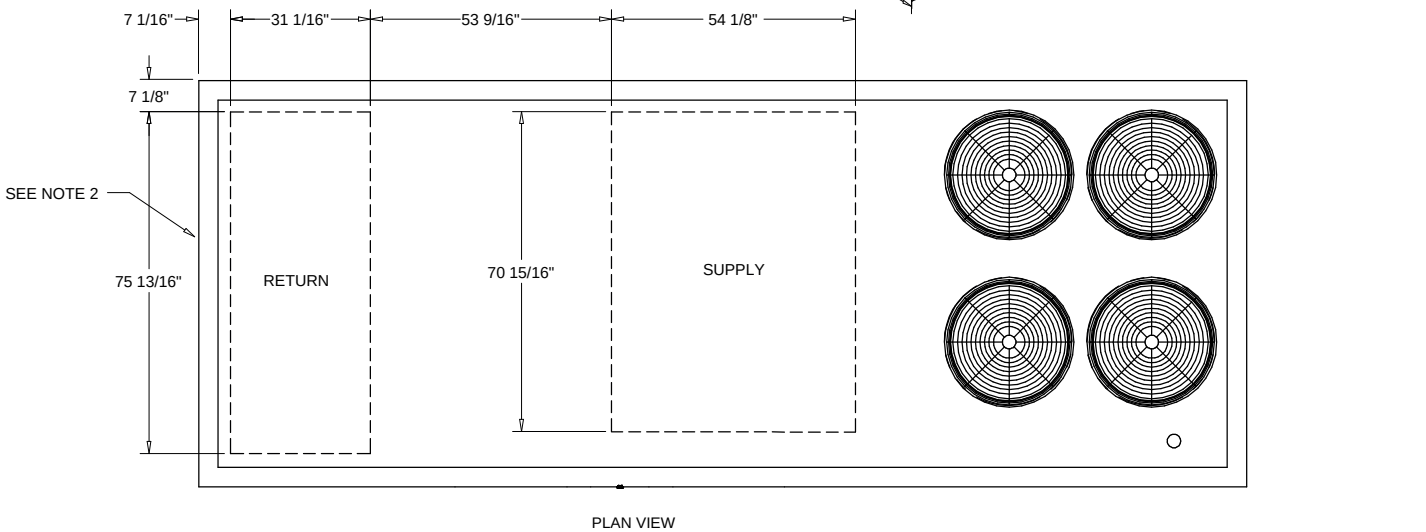
Roof Curb
The roof curb shall be designed to mate with the unit and provide support and a water tight installation when installed properly. The roof curb design shall allow field-fabricated rectangular supply/return ductwork to be connected directly to the curb when used with downflow units. Curb design shall comply with NRCA requirements. Curb shall ship knocked down for field assembly and include wood nailer strips.

Zone Sensors
Shall be provided to interface with the ReliaTel unit controls and shall be available in either manual, automatic programmable with night setback, with system malfunction lights or remote sensor options.

Room sensor w/ Temperature Adjustment and Override - BAYSENS074
Zone temperature sensor with local temperature adjustment control and timed override buttons used with Tracer Integrated Comfort system. May also be used for Morning Warm-up setpoint and sensor.

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON


NOTES:
1. SEE ROOFCURB DRAWING FOR DETAILS ON FIELD DUCT FITUP AND CONNECTIONS
2. SEE DETAIL HOOD DRAWING FOR HORIZONTAL / DOWNFLOW UNITS FOR ADDITIONAL DIMENSION AND LOCATION.
3. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
90 5/8"
232 3/4"
SEE NOTE 2
3 1/4" TO TOP OF FAN GRILLE
77"
49 9/16"
5 5/16"
93 3/8"
7 9/16"
1 1/4" FEMALE PVC PIPE
GAS INLET
232 3/8"
CUSTOMER CONNECTION POINT
46 15/16"
4 3/4"
90 1/16"

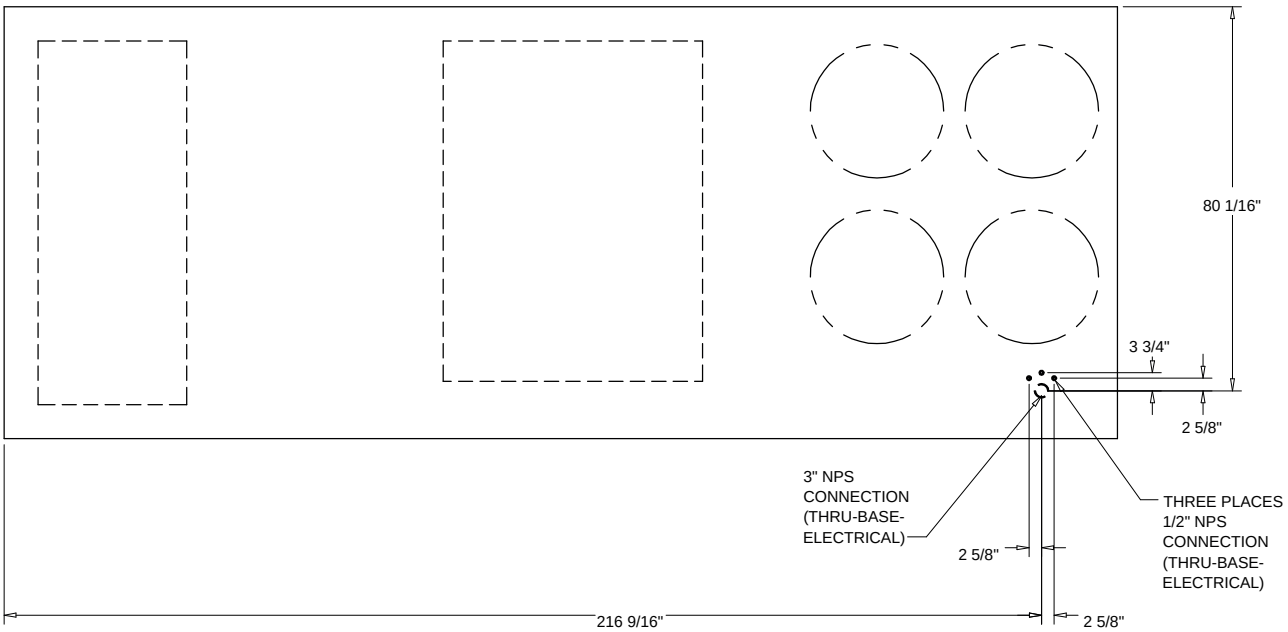


PLAN VIEW

DOWNFLOW SUPPLY AND UPFLOW RETURN CONFIGURATION

DIMENSIONAL DRAWING

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON



NOTES:
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2. VERIFY ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

THRU -THE -BASE ELECTRICAL PROVISION

PLAN VIEW

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON

ELECTRICAL / GENERAL DATA

UNIT

Model (Tonnage)	YCD600 (50.0)
Operating voltage range:	414 - 506
Primary voltage:	460
Hertz:	60
Phase:	3
EER / IEER:	10.3 EER/10.9 EER

HEATING - PERFORMANCE

Heat:	High
Heating Input (mbh):	800,000
First Stage (mbh):	600,000
Heating Output (mbh):	648,000
First Stage (mbh):	486,000
No Burners:	2
No. Stages / Turn Down Rate:	2
Gas Supply Pressure (in w.c.)	
Natural or LP:	2.5/14.0
Gas Connection Pipe Size:	1"

COMPRESSOR

Number	2/1
Tons	13.0 /15.0
Compressor Rated Load Amps	23.0 / 27.5
Locked Rotor Amps	158.0/ 197.0

ELECTRIC HEATER

Electric Heater kw	N/A
Electric Heater Full Load Amps	N/A

INDOOR MOTOR

Horsepower	20.0
Motor speed (rpm)	1,760
Indoor motor full load amps	24.7

OUTDOOR MOTOR

Number	4
Horsepower	1.1
Phase	1
Outdoor motor full load amps	3.5

EXHAUST MOTOR

Number	N/A
Horsepower	N/A
Phase	N/A
Exhaust motor full load amps	N/A

FILTERS (7)

Type	Throwaway
Furnished	Yes
Number	16
Recommended size	15 1/2"x19 1/2"x2"

REFRIGERANT TYPE (6)

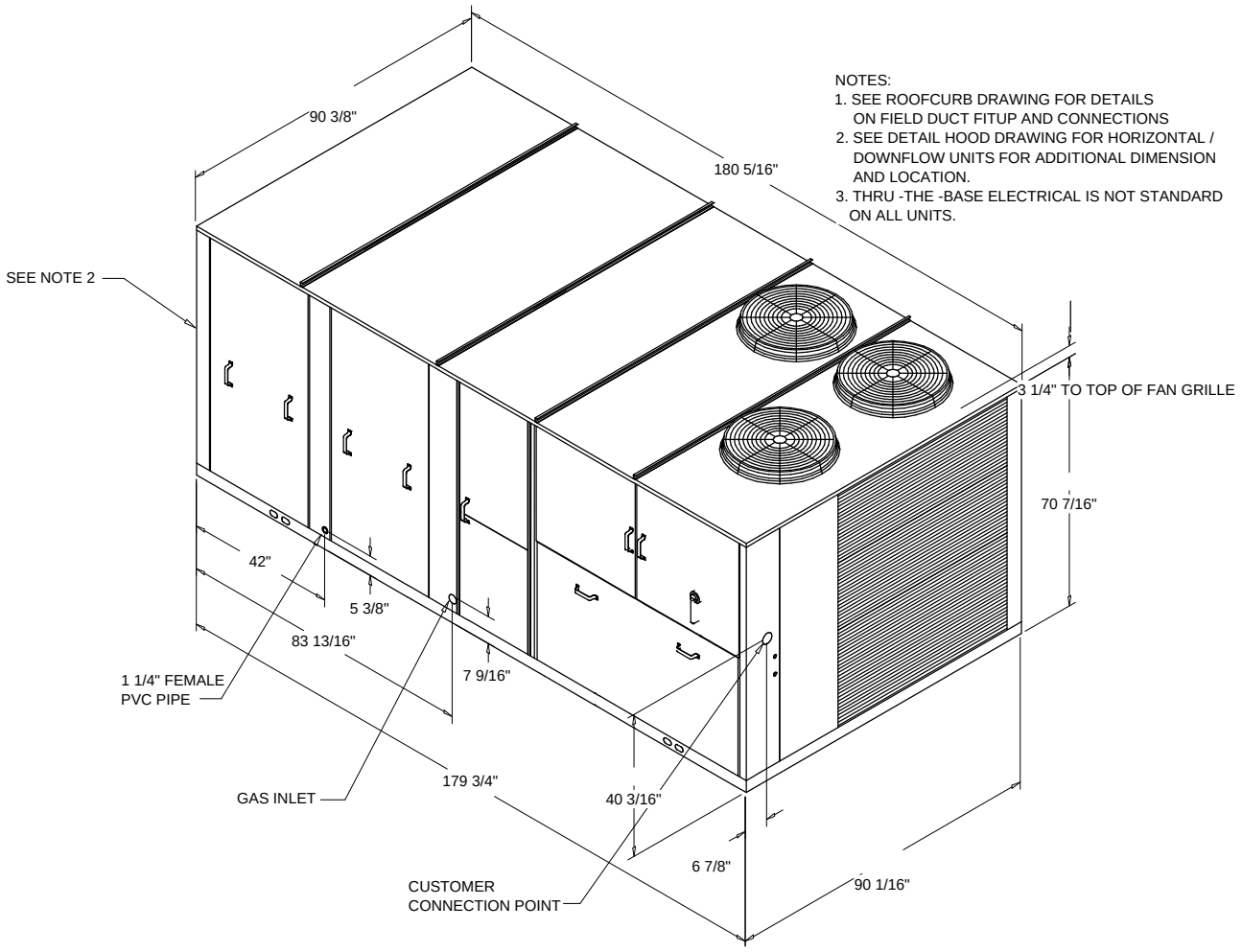
Type	R-410A
Factory Charge (Circuit #1)	20.0 lb
Factory Charge (Circuit #2)	38.8 lb

Cooling MCA = (1.25 x Load 1) + Load 2 + Load 4

Cooling MOP = (2.25 x Load 1) + Load 2 + Load 4

Notes:
1. LOAD 1= Current of the largest motor (Compressor or Fan Motor); LOAD 2=Sum of the currents of all remaining motors LOAD 3= FLA(Full Load Amps) of the electric heater; LOAD 4= Any other load rated at 1 amp or more.
2. For Electric Heat MCA, MOP, RDE values, calculate for both cooling and heating modes.
3. If selected Max Over Cur is less than the Min Cir Amp, then select the lowest maximum fuse size which is equal to or larger than the Min Cir Amp, provided the selected fuse size does not exceed 800 amps.
4. The use of Liquid Propane (LP) requires unit modification. Contact a Trane salesman for information.
5. Compressor KW at AHRI rating conditions of 80/67 -95
6. Refrigerant charge is an approx. value. For a more precise value, see unit nameplate and service instructions.
7. Filter dimension are actual. Norminal filter size 16"x20"

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A2 Qty: 1 Tag(s): 30 TON


NOTES:
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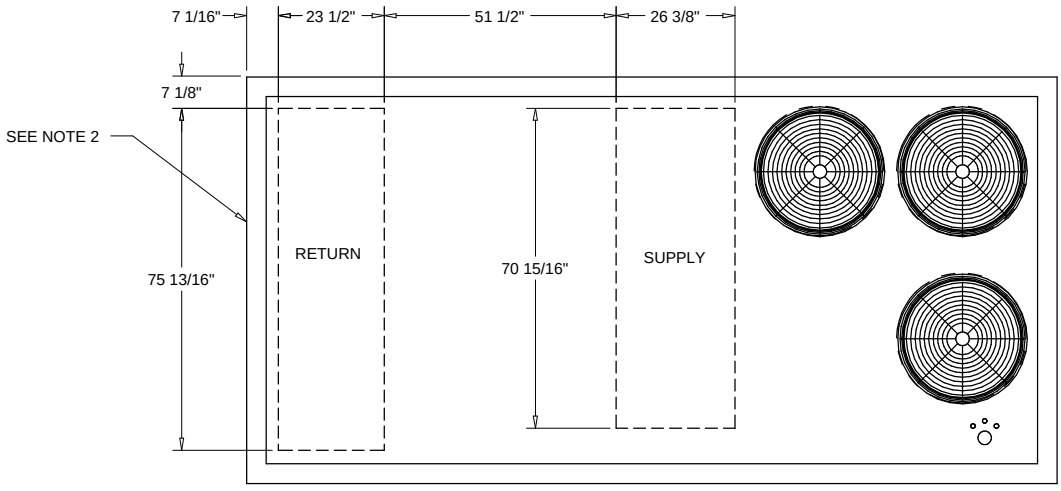
2. SEE DETAIL HOOD DRAWING FOR HORIZONTAL / DOWNFLOW UNITS FOR ADDITIONAL DIMENSION AND LOCATION.
3. THRU -THE -BASE ELECTRICAL IS NOT STANDARD ON ALL UNITS.
90 3/8"
180 5/16"
SEE NOTE 2
3 1/4" TO TOP OF FAN GRILLE
70 7/16"
42"
5 3/8"
83 13/16"
7 9/16"
1 1/4" FEMALE PVC PIPE
GAS INLET
179 3/4"
40 3/16"
6 7/8"
90 1/16"
CUSTOMER CONNECTION POINT

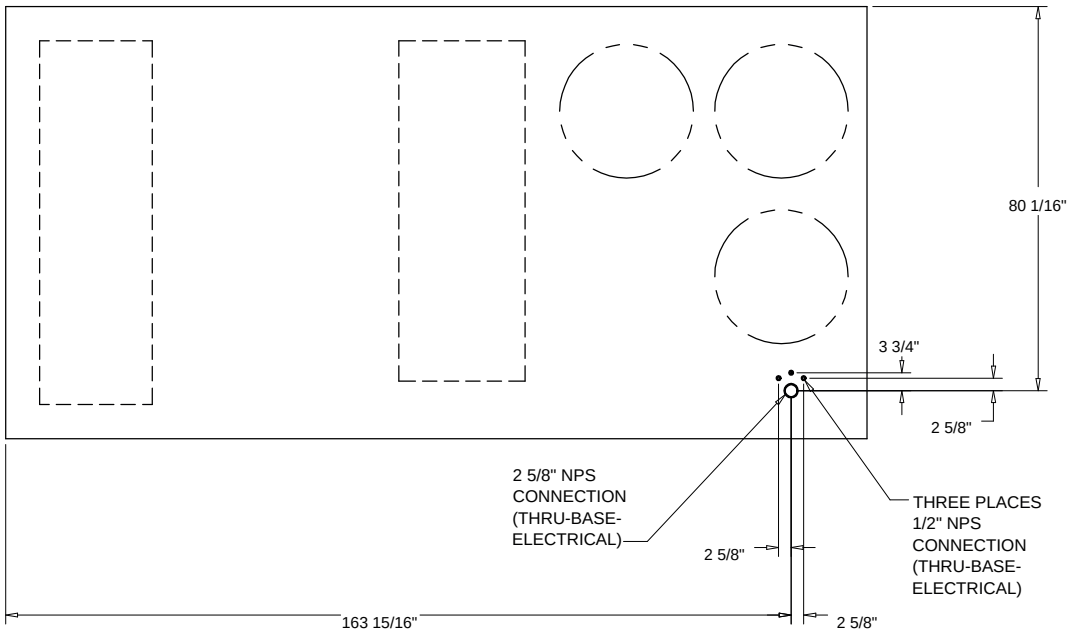


PLAN VIEW

DOWNFLOW SUPPLY AND UPFLOW CONFIGURATION

DIMENSIONAL DRAWING

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A2 Qty: 1 Tag(s): 30 TON



NOTES:
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2. VERIFY ALL DIMENSIONS WITH INSTALLER DOCUMENTS BEFORE INSTALLATION.

THRU -THE -BASE ELECTRICAL PROVISION

PLAN VIEW

Unit Dimensions - Packaged Rooftop, Cooling / Heating Units
Item: A2 Qty: 1 Tag(s): 30 TON

ELECTRICAL / GENERAL DATA

UNIT

Model (Tonnage)	YCD360 (30.0)
Operating voltage range:	414 - 506
Primary voltage:	460
Hertz:	60
Phase:	3
EER / IEER:	10.3 EER/12.0 EER

HEATING - PERFORMANCE

Heat:	Low
Heating Input (mbh):	350,000
First Stage (mbh):	250,000
Heating Output (mbh):	283,500
First Stage (mbh):	202,500
No Burners:	1
No. Stages / Turn Down Rate:	2
Gas Supply Pressure (in w.c.)	
Natural or LP:	2.5/14.0
Gas Connection Pipe Size:	3/4"

COMPRESSOR

Number	1/1
Tons	13.0/13.0
Compressor Rated Load Amps	23.0/23.0
Locked Rotor Amps	158.0/158.0

ELECTRIC HEATER

Electric Heater kw	N/A
Electric Heater Full Load Amps	N/A

INDOOR MOTOR

Horsepower	7.5
Motor speed (rpm)	1,760
Indoor motor full load amps	9.4

OUTDOOR MOTOR

Number	3
Horsepower	1.1
Phase	1
Outdoor motor full load amps	3.5

EXHAUST MOTOR

Number	N/A
Horsepower	N/A
Phase	N/A
Exhaust motor full load amps	N/A

FILTERS (7)

Type	Throwaway
Furnished	Yes
Number	16
Recommended size	15 1/2"x19 1/2"x2"

REFRIGERANT TYPE (6)

Type	R-410A
Factory Charge (Circuit #1)	29.3 lb
Factory Charge (Circuit #2)	Not Available

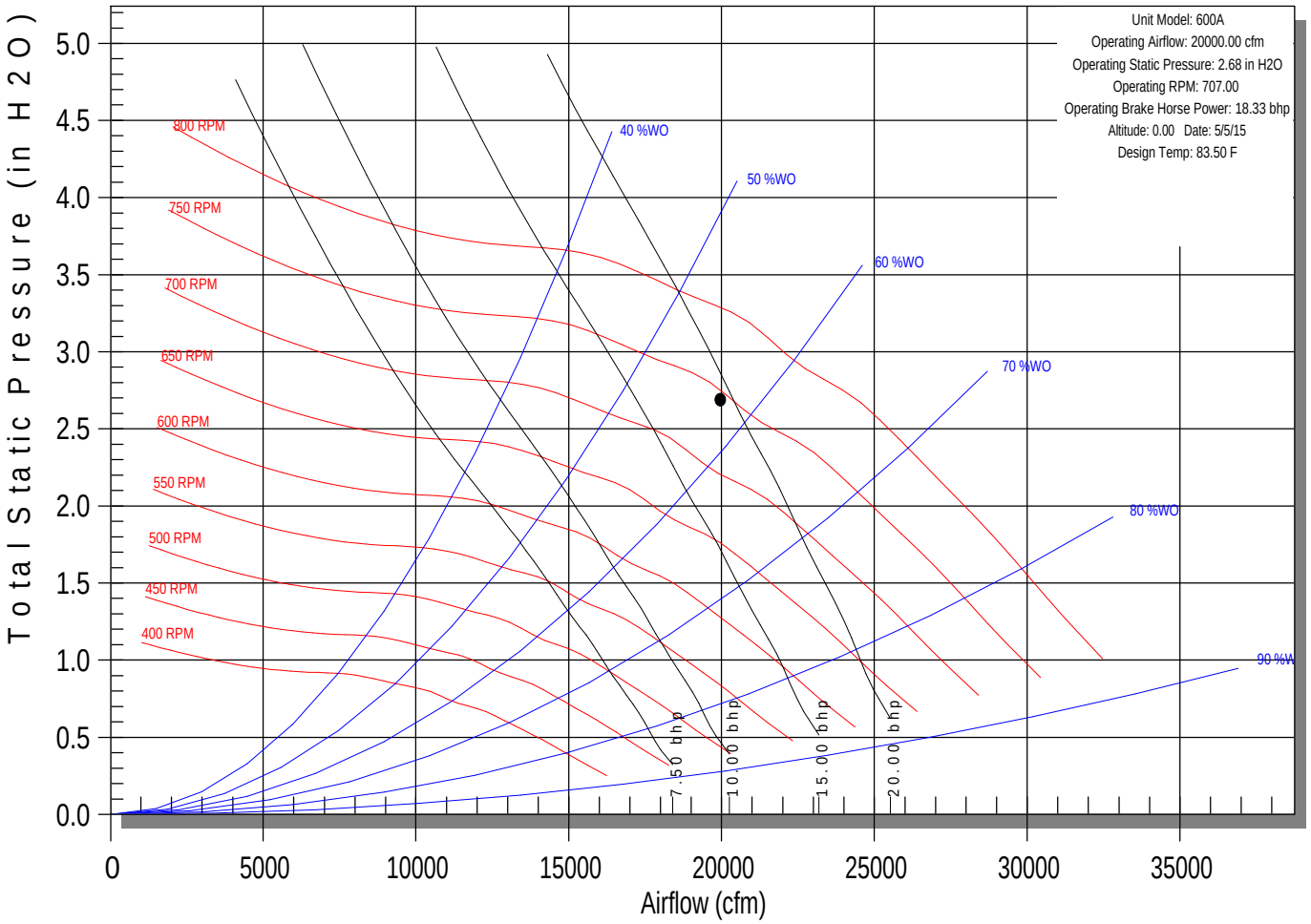
Cooling MCA = (1.25 x Load 1) + Load 2 + Load 4

Cooling MOP = (2.25 x Load 1) + Load 2 + Load 4

Notes:
1. LOAD 1= Current of the largest motor (Compressor or Fan Motor); LOAD 2=Sum of the currents of all remaining motors LOAD 3= FLA(Full Load Amps) of the electric heater; LOAD 4= Any other load rated at 1 amp or more.
2. For Electric Heat MCA, MOP, RDE values, calculate for both cooling and heating modes.
3. If selected Max Over Cur is less than the Min Cir Amp, then select the lowest maximum fuse size which is equal to or larger than the Min Cir Amp, provided the selected fuse size does not exceed 800 amps.
4. The use of Liquid Propane (LP) requires unit modification. Contact a Trane salesman for information.
5. Compressor KW at AHRI rating conditions of 80/67 -95
6. Refrigerant charge is an approx. value. For a more precise value, see unit nameplate and service instructions.
7. Filter dimension are actual. Norminal filter size 16"x20"

Fan Curve - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON

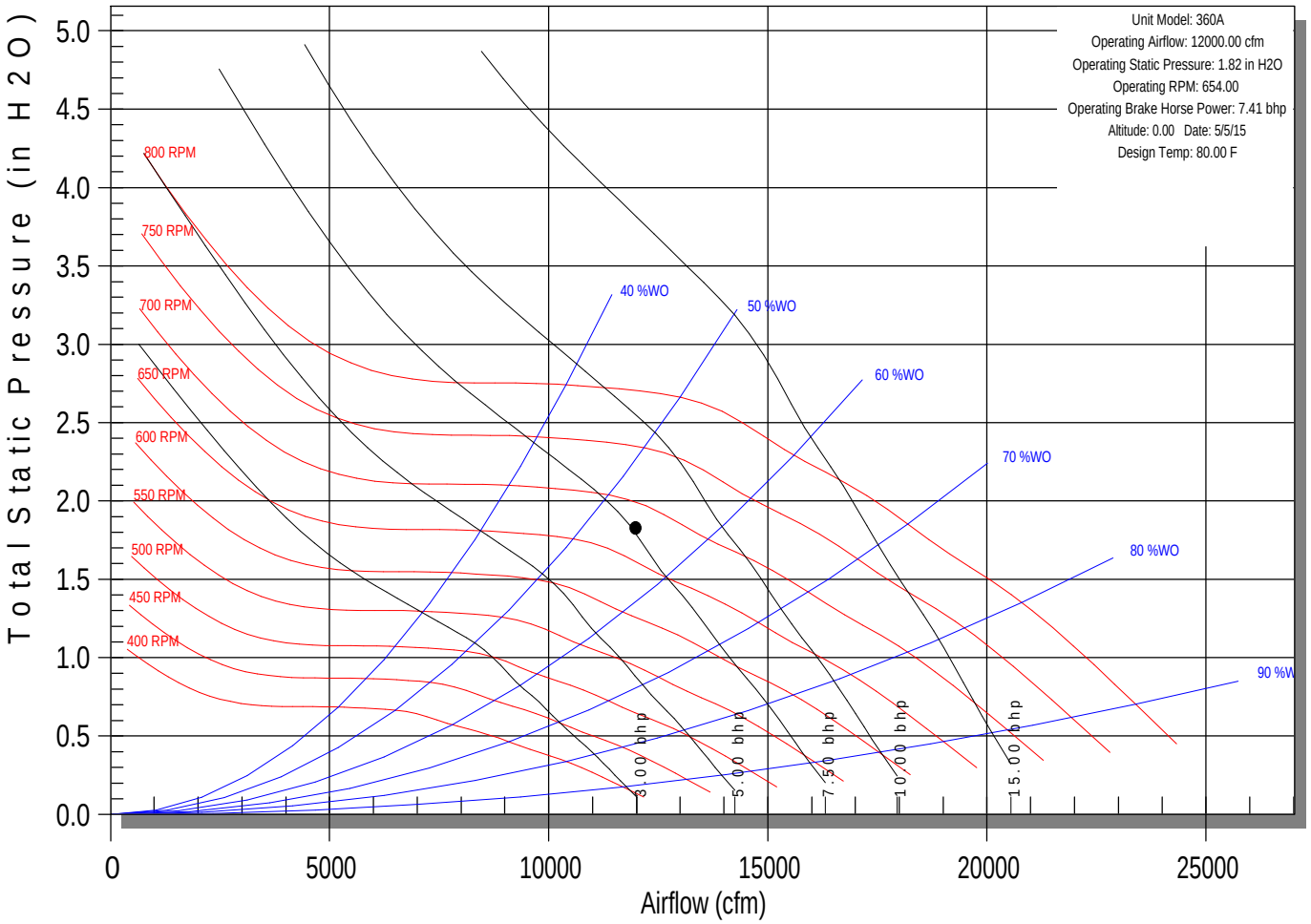
V60



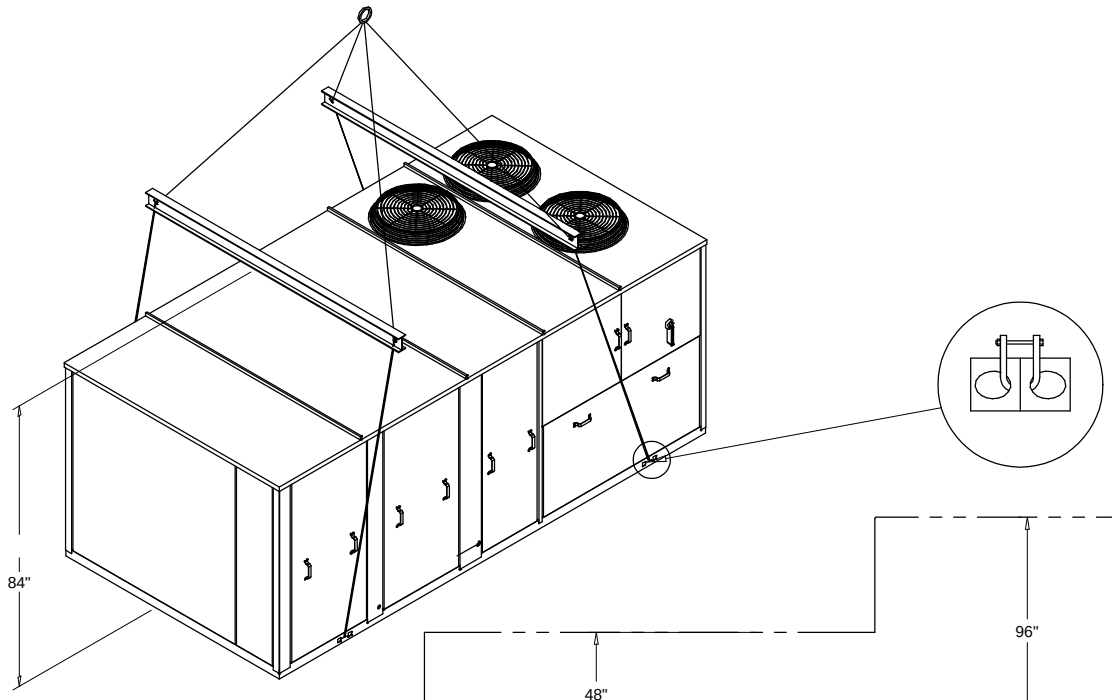
Fan Curve - Packaged Rooftop, Cooling / Heating Units

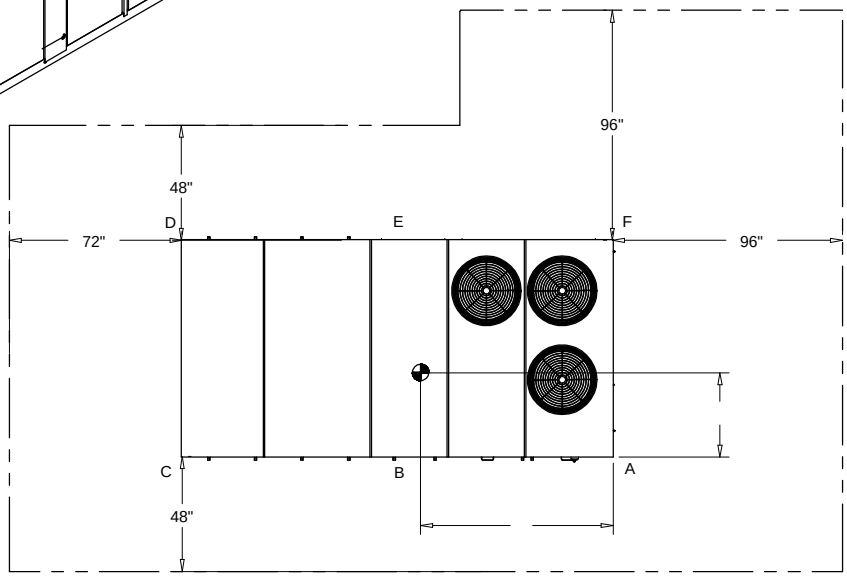
Item: A2 Qty: 1 Tag(s): 30 TON

V36



Weight, Clearance & Rigging Diagram - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON





CLEARANCE NOTES:
1. HORIZONTAL AND DOWNFLOW UNITS, ALL SIZES.
2. CONDENSER COIL IS LOCATED AT THE END AND SIDE OF THE UNIT.
3. CLEARANCES ON MULTIPLE UNIT INSTALLATIONS ARE DISTANCES BETWEEN UNITS.
4. ECONO / EXHAUST END MULTIPLE UNITS 144".
5. CONDENSER COIL END/SIDE 192" TO 96"
6. SERVICE SIDE ACCESS 96"

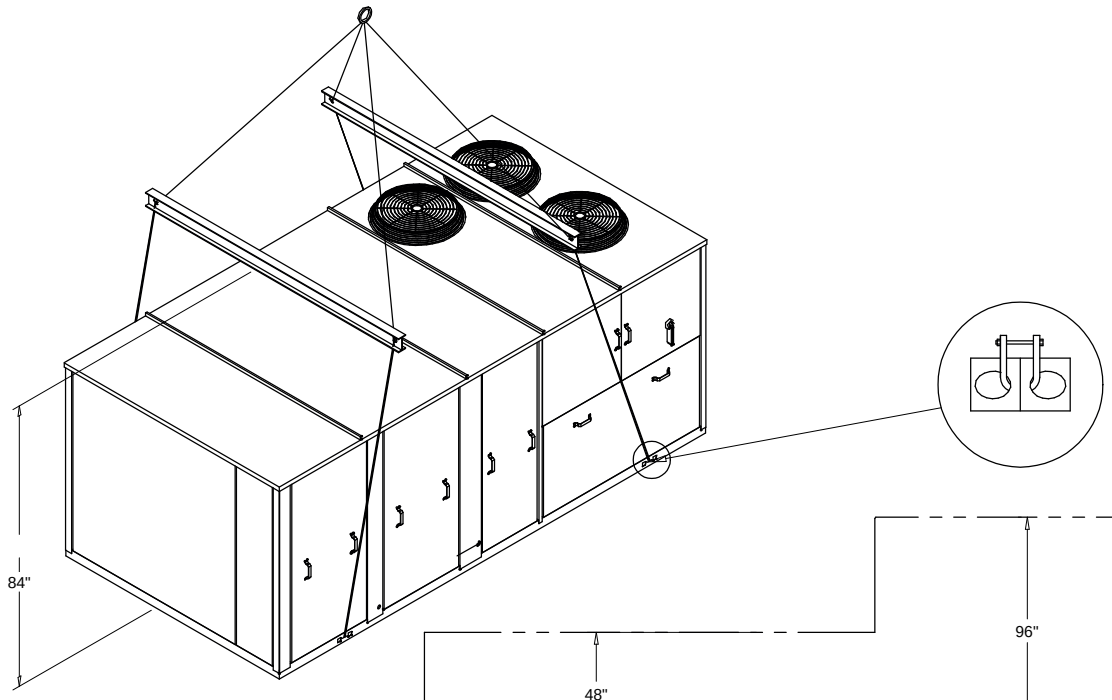
MAXIMUM OPERATION WEIGHT: 6925.0 lb
MINIMUM OPERATION WEIGHT: 4905.0 lb

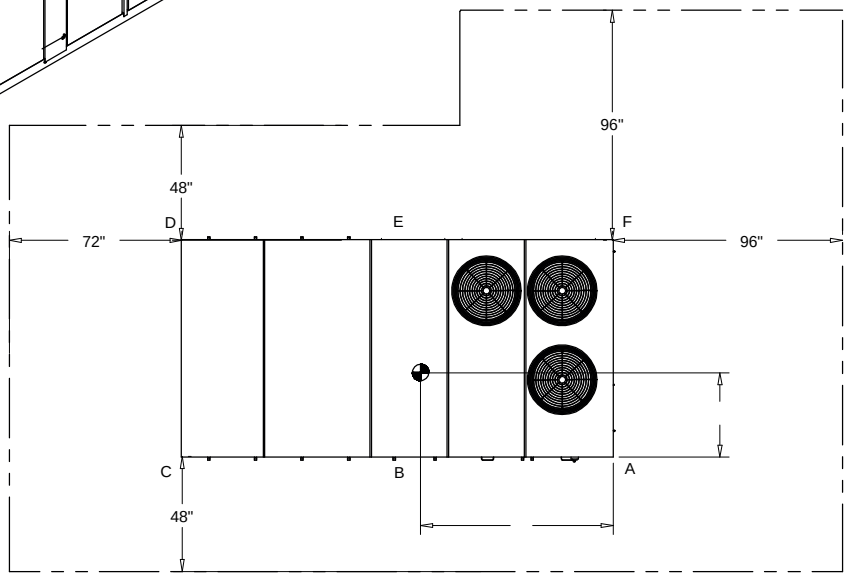
CENTER OF GRAVITY					
X	43"	Y	108"		
CORNER LOADING PERCENTS					
A	B	C	D	E	F
17%	18%	18%	14%	16%	16%

OPTIONAL COMPONENTS					
POWER EXHAUST	"	BARO. RELIEF	110.0 lb	SERVICE VALVES	"
ECONOMIZER	290.0 lb	THRU-BASE ELECTRICAL	6.0 lb	HI-EFF SUP. FAN	"
MANUAL DAMPERS	"	GFI WITH DISCON. SWITCH	N/A	DISC. SWITCH	30.0 lb
INLET GUIDE VANES	"	HI-EFF COND COIL	N/A	VFD	"
COIL HAIL GUARD		MOD. HOT GAS REHEAT			

WEIGHT NOTES:
1. BASIC UNIT WEIGHT INCLUDES MINIMUM HORSEPOWER SUPPLY FAN MOTOR AND STANDARD EFFICIENCY 2-ROW CONDENSER COIL.
2. OPTIONAL HIGH EFFICIENCY MOTOR WEIGHTS ARE IN ADDITION TO THE STANDARD MOTOR WEIGHTS INCLUDED IN THE ASIC UNIT WEIGHT
3. OPTIONAL HIGH EFFICIENCY 3-ROW CONDENSER COIL WEIGHTS ARE IN ADDITION TO THE STANDARD
4. 2-ROW COIL WEIGHT INCLUDED IN THE BASIC UNIT WEIGHT
5. WHEN AN OPTIONAL HIGH EFFICIENCY SUPPLY FAN MOTOR IS SELECTED, THE WEIGHT SHOWN SHOULD BE ADDED TO THE BASIC UNIT WEIGHT.
6. WHEN AN OPTIONAL HIGH EFFICIENCY CONDENSER COIL IS SELECTED, THE WEIGHT SHOWN SHOULD BE ADDED TO THE BASIC UNIT WEIGHT.
7. THE ACTUAL WEIGHT IS STAMPED ON THE UNIT NAMEPLATE.
8. THE WEIGHT SHOWN REPRESENT THE TYPICAL UNIT OPERATING WEIGHT FOR THE UNIT SELECTED
9. DESIGN SPECIAL WEIGHT ARE NOT INCLUDED IN THE SUBMITTAL.

Weight, Clearance & Rigging Diagram - Packaged Rooftop, Cooling / Heating Units
Item: A2 Qty: 1 Tag(s): 30 TON





CLEARANCE NOTES:
1. HORIZONTAL AND DOWNFLOW UNITS, ALL SIZES.
2. CONDENSER COIL IS LOCATED AT THE END AND SIDE OF THE UNIT.
3. CLEARANCES ON MULTIPLE UNIT INSTALLATIONS ARE DISTANCES BETWEEN UNITS.
4. ECONO / EXHAUST END MULTIPLE UNITS 144".
5. CONDENSER COIL END/SIDE 192" TO 96"
6. SERVICE SIDE ACCESS 96"

MAXIMUM OPERATION WEIGHT: 5760.0 lb
MINIMUM OPERATION WEIGHT: 3695.0 lb

CENTER OF GRAVITY					
X	43"	Y	77"		
CORNER LOADING PERCENTS					
A	B	C	D	E	F
21%	16%	18%	17%	14%	15%

OPTIONAL COMPONENTS					
POWER EXHAUST	"	BARO. RELIEF	110.0 lb	SERVICE VALVES	"
ECONOMIZER	260.0 lb	THRU-BASE ELECTRICAL	6.0 lb	HI-EFF SUP. FAN	"
MANUAL DAMPERS	"	GFI WITH DISCON. SWITCH	N/A	DISC. SWITCH	30.0 lb
INLET GUIDE VANES	"	HI-EFF COND COIL	N/A	VFD	"
COIL HAIL GUARD		MOD. HOT GAS REHEAT			

WEIGHT NOTES:
1. BASIC UNIT WEIGHT INCLUDES MINIMUM HORSEPOWER SUPPLY FAN MOTOR AND STANDARD EFFICIENCY 2-ROW CONDENSER COIL.
2. OPTIONAL HIGH EFFICIENCY MOTOR WEIGHTS ARE IN ADDITION TO THE STANDARD MOTOR WEIGHTS INCLUDED IN THE ASIC UNIT WEIGHT
3. OPTIONAL HIGH EFFICIENCY 3-ROW CONDENSER COIL WEIGHTS ARE IN ADDITION TO THE STANDARD
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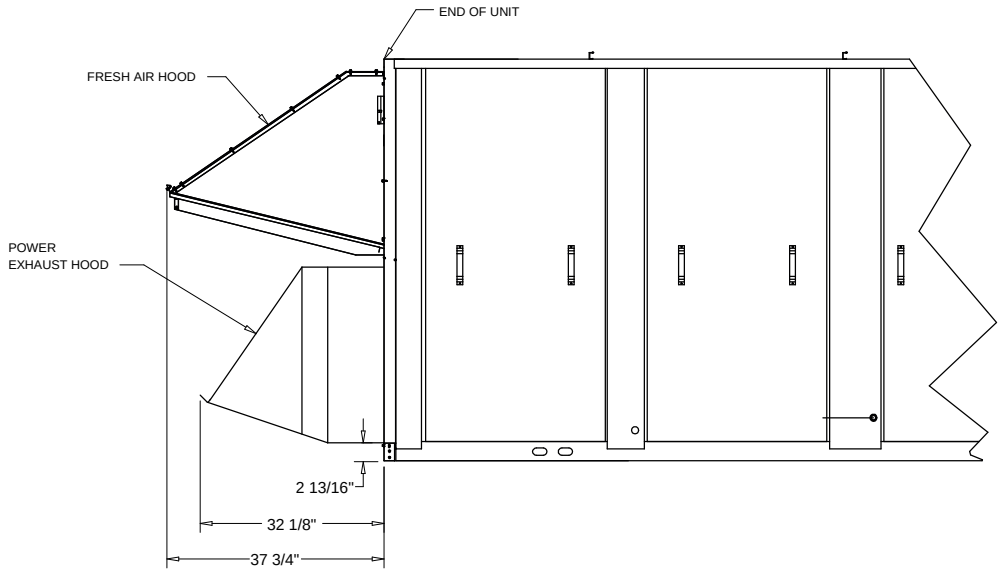
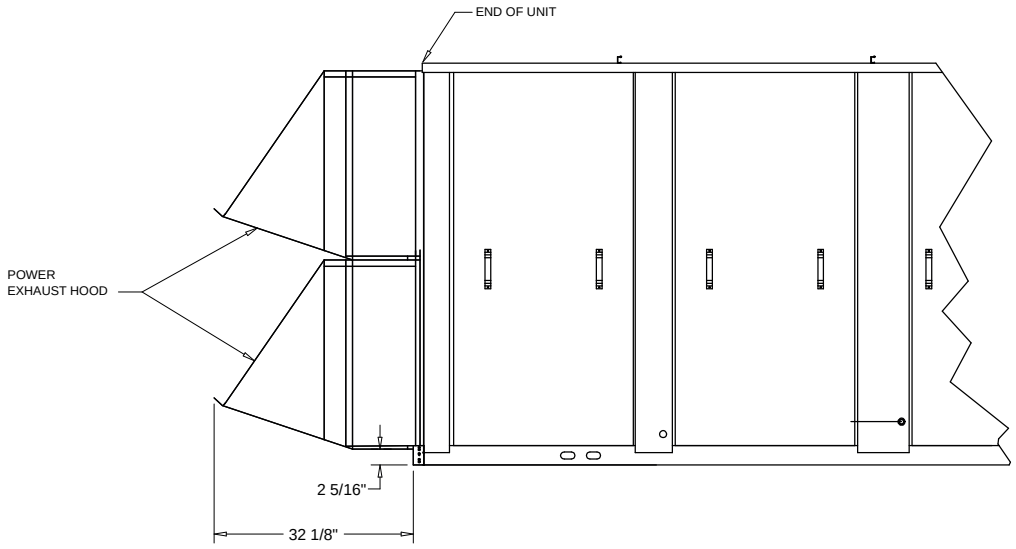
5. WHEN AN OPTIONAL HIGH EFFICIENCY SUPPLY FAN MOTOR IS SELECTED, THE WEIGHT SHOWN SHOULD BE ADDED TO THE BASIC UNIT WEIGHT.
6. WHEN AN OPTIONAL HIGH EFFICIENCY CONDENSER COIL IS SELECTED, THE WEIGHT SHOWN SHOULD BE ADDED TO THE BASIC UNIT WEIGHT.
7. THE ACTUAL WEIGHT IS STAMPED ON THE UNIT NAMEPLATE.
8. THE WEIGHT SHOWN REPRESENT THE TYPICAL UNIT OPERATING WEIGHT FOR THE UNIT SELECTED
9. DESIGN SPECIAL WEIGHT ARE NOT INCLUDED IN THE SUBMITTAL.

Accessory - Packaged Rooftop, Cooling / Heating Units
Item: A1, A2 Qty: 6 Tag(s): 50 TON, 30 TON

NOTE:
1. THE TWO HORIZONTAL POWER EXHAUST HOODS AND THE THREE HORIZONTALFRESH AIR HOODS ARE LOCATED SIDE BY SIDE. THE FRESH AIR HOODS (NOT SHOWN) EXTEND ONLY 23 15/16" FROM THE END OF THE UNIT.



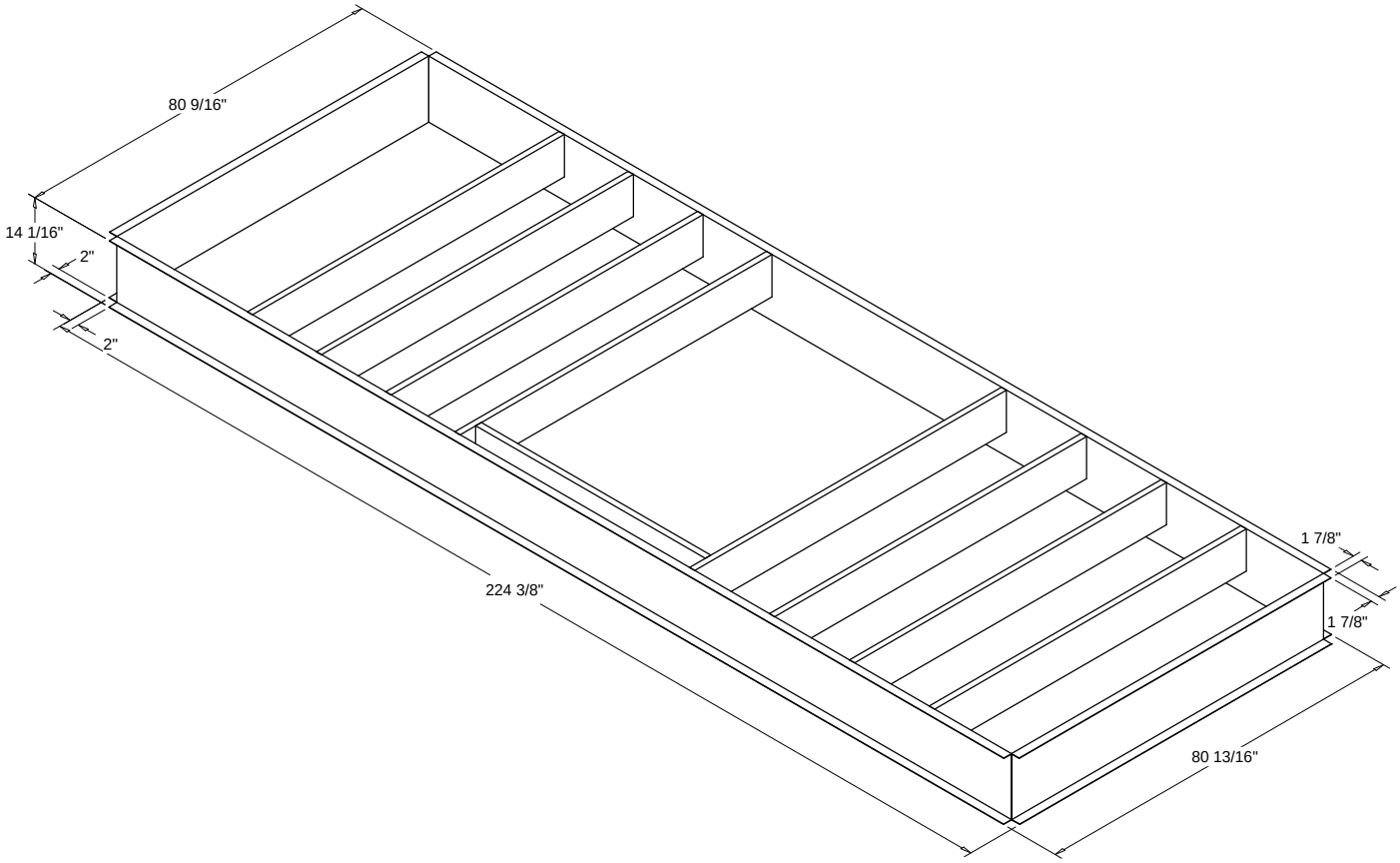
FRESH AIR POWER EXHAUST
DOWNFLOW UNITS

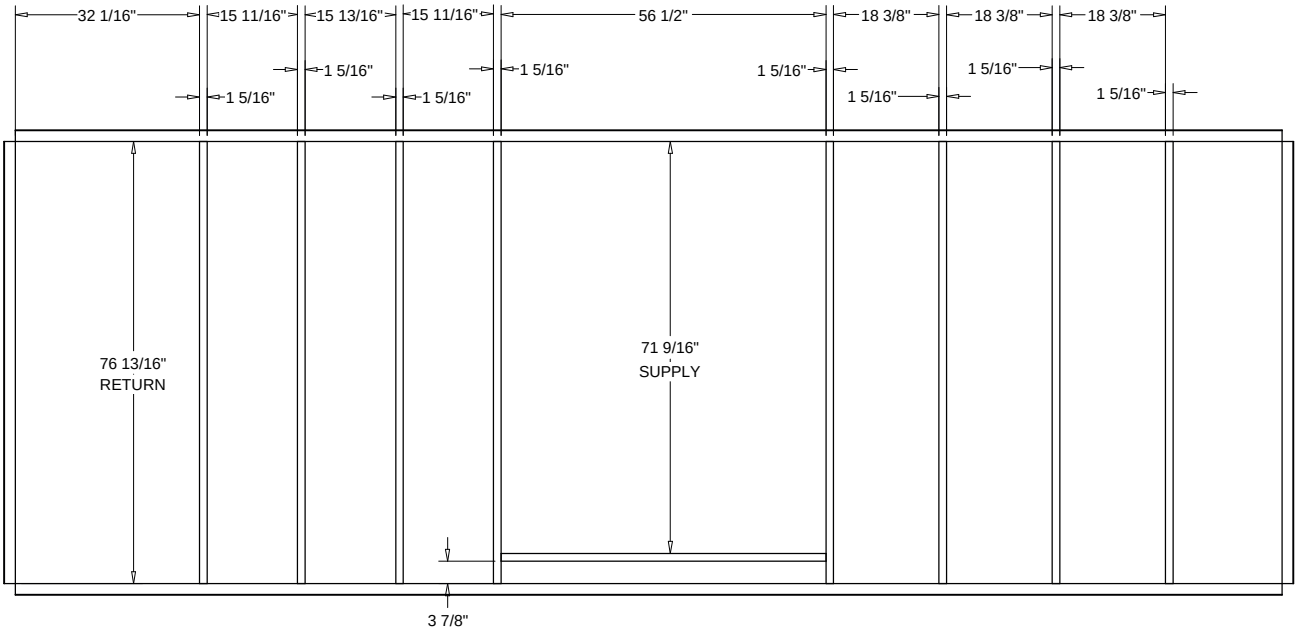


POWER EXHAUST HOODS
HORIZONTAL UNITS

HOOD DRAWING FOR HORIZONTAL / DOWNFLOW UNITS
UNIT DETAIL

Accessory - Packaged Rooftop, Cooling / Heating Units
Item: A1 Qty: 5 Tag(s): 50 TON



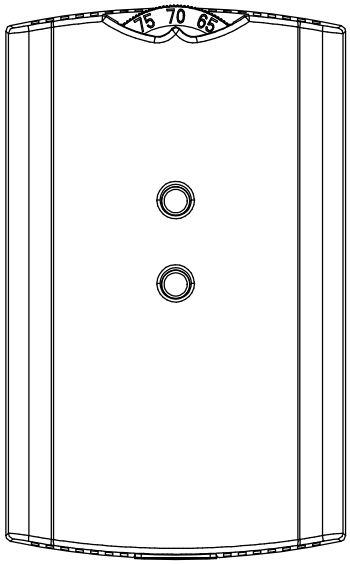


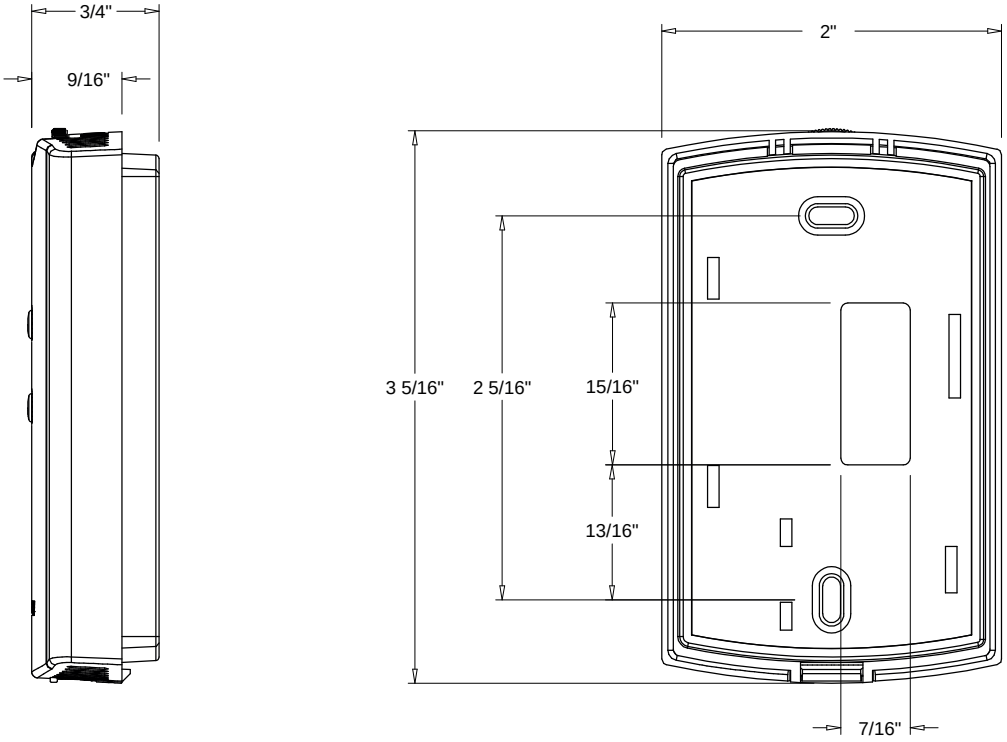
WEIGHT: 365.0 lb

ROOF CURB

UNIT DRAWING

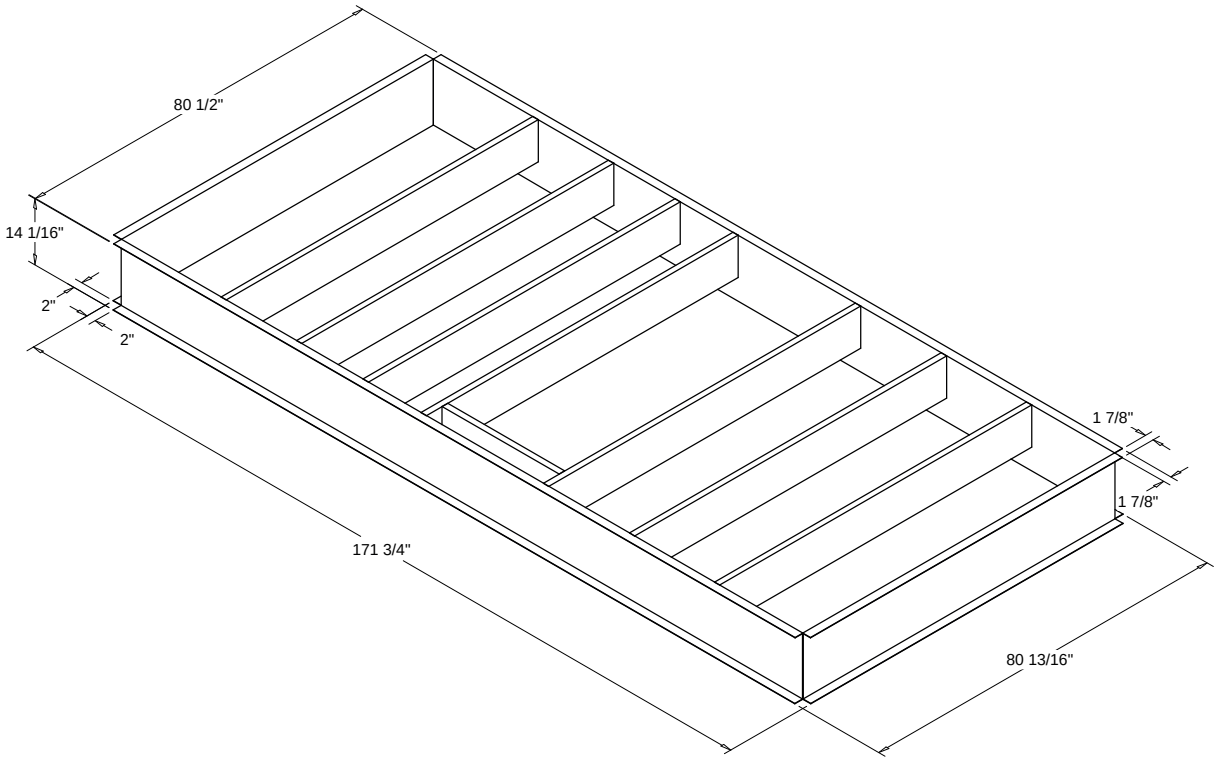
Accessory - Packaged Rooftop, Cooling / Heating Units
Item: A1, A2 Qty: 6 Tag(s): 50 TON, 30 TON

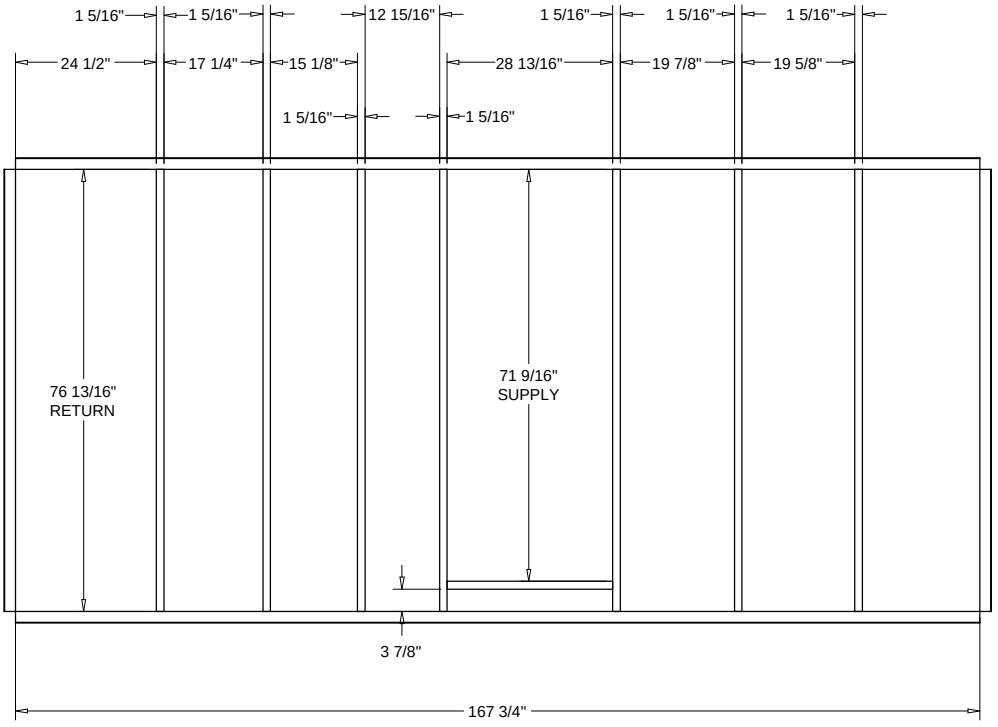




BAYSENS074
ROOM SENSOR WITH TEMPERATURE ADJUSTMENT AND OVERRIDE

Accessory - Packaged Rooftop, Cooling / Heating Units
Item: A2 Qty: 1 Tag(s): 30 TON





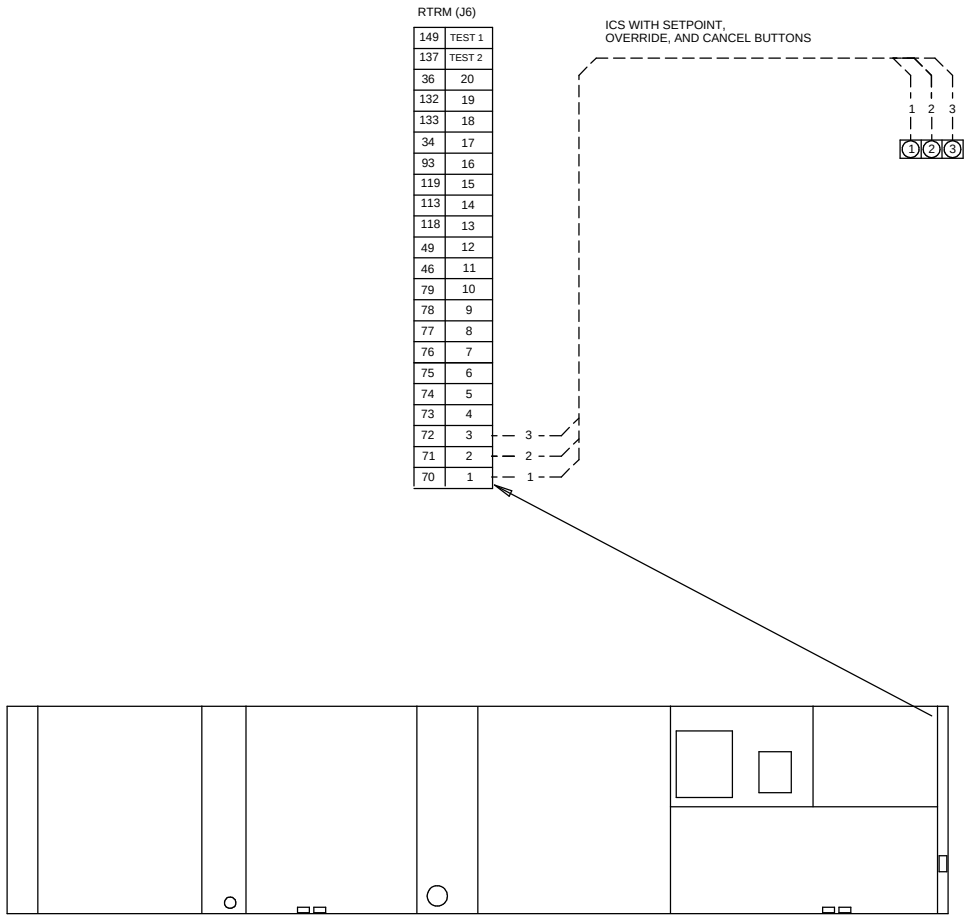
WEIGHT: 310.0 lb

ROOF CURB

UNIT DRAWING

Field Wiring - Packaged Rooftop, Cooling / Heating Units
Item: A1, A2 Qty: 6 Tag(s): 50 TON, 30 TON

BAYSENS014C ZONE SENSOR



ZONE SENSOR WIRE TABLE

WIRE SIZE	MAXIMUM WIRE LENGTH in
22 GAUGE	1800"
20 GAUGE	3000"
18 GAUGE	4500"
16 GAUGE	7200"
14 GAUGE	11700"

NOTE:
1. All wiring and devices shown dashed to be supplied and installed by the customer in accordance with national and local electrical codes.
2. Low voltage control wiring must not be run in conduit with power wiring.
3. Cut wire jumper adjacent to the terminal 1 on zone sensor.

Field Installed Options - Part/Order Number Summary
This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

Product Family - Packaged Rooftop, Cooling / Heating Units

Item	Tag(s)	Qty	Description	Model Number
A1	50 TON	5	50 Ton Voy III	YCD600B4H-1B4N D2-BC-E---0K0-00 R-0-------XA--*

Field Installed Option Description	Part/Ordering Number
Room sensor with temperature adjustment and override	BAYSENS074A
Flat Roof Curb	BAYCURB037A

Item	Tag(s)	Qty	Description	Model Number
A2	30 TON	1	30 Ton Voy III	YCD360B4L-1B1C D2-BC-E---0K0-00 R-0-------XA--*

Field Installed Option Description	Part/Ordering Number
Room sensor with temperature adjustment and override	BAYSENS074A
Flat Roof Curb	BAYCURB035A

HVAC Submittal Cover Sheet

SECTION: 2
PRODUCT: Air Compressors

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Ingersoll Rand
SUPPLIER:	Ingersoll Rand
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

Presented To:

- Carden Clark
  Paulson-Cheek Mechanical
  6145 Northbelt Parkway, Suite F
  Norcross, GA 30071

Project:

Compressed Air System Submittal
Medline Industries, Inc.
Lithia Springs Manufacturing Site

Prepared By:

- Christopher George
  cgeorge@irco.com
  6135-E Northbelt Drive
  Norcross, GA 30071
  Direct: (770) 903-4612
  Fax: (866) 495-2711
  Cell Phone: (404) 217-1410

Prepared On: 5/21/2015

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• Post-Filter General Arrangement Drawing	17
• Electrical Schematic	18
• General Arrangement Drawing - PNLD II - 28	19

Equipment List

Product Description	Qty
R225ne (300 HP) Variable Speed Rotary Screw Air Compressor	2
• 460 Volt Hybrid Permanent Magnet Motor	
• Line Reactor (shipped loose)	
• Xe Series Controller	
• Air Cooled After Cooler	
• Electronic No Loss Drain Valve	
• Sound Attenuating Enclosure	
HL1500 Desiccant Dryer	2
• High Efficiency Coalescing Pre-Filter	
• General Particulate Post-Filter	
• PNLD II - 28 Pneumatic No Loss Drain Valve	

Rotary Screw Air Compressor
R225ne (300 Hp)

Image for reference only

Technical Information:

Available Flow (Capacity):

- 1476-639 cfm @125 psig

Weight: 13080 lbs

Compressed air outlet size: 3.0" NPT

Condensate drain outlet size: 0.5”

Dimensions - Facing control panel (L x W x H): 158" x 76" x 85"

Sound Level per ANSI S5.1 Standard

- Aircooled 80 dBA

Additional Engineering Data available upon request

Product Description:

Ingersoll Rand’s NEW R-Series 190-225 kW/250-300hp contact-cooled rotary screw air compressors offer the very best of time-proven designs and new technologies integrating advanced features to ensure the highest levels of reliability, efficiency and productivity available today. Our NEW energy-efficient packages deliver performance and value that best fits your specific needs.

By combining the advanced technologies of HPM® motor, Intellisys SGNe Controller, and coolant conditioning with a premium, two-stage airend, the NIRVANA contact-cooled model is mechanically simplified and designed to maximize energy conservation.

The two-stage airend reduces the compression ratio at each stage, which compresses more efficiently (bhp/100) and reduces axial loading of the thrust bearings. These design elements provide the customer with exceptional reliability, reduced energy costs, and customized operational controls. This two-stage airend / VSD drive combination can provide energy savings of 33%-41% when compared with a traditional fixed speed, single-stage compressor.

Key Features & Benefits:

- HPM® Motor
- Intellisys SGNe Controller
- Coolant Conditioning
- Integrated Variable Speed Drive
- Ultra Coolant
- 115˚F Ambient Rated

Visit the Ingersoll Rand website for further information http://www.ingersollrandproducts.com

Ingersoll Rand
Industrial Technologies

R225NE

CCN: 23570773
Rev.: C
Sheet: 1 of 2
Date: 8-Mar-2010

Model Name		R225NE					
GENERAL PERFORMANCE DATA							
Package Discharge Pressure	barg (psig)	7 (100)	7.5 (110)	8 (115)	8.5 (125)	9.5 (135)	10 (145)
Capacity @ Max Speed FAD (1)	m³/min (cfm)	46.01 (1625)	44.74 (1580)	43.61 (1540)	41.80 (1476)	40.69 (1437)	40.35 (1425)
Capacity @ Min Speed FAD (1)	m³/min (cfm)	18.73 (661)	18.34 (648)	18.23 (644)	18.10 (639)	18.27 (645)	18.84 (665)
Turndown Percentage	%	59%	59%	58%	57%	55%	53%
Maximum Target Operating Pressure (2)	barg (psig)	10 (145)					
Maximum Ambient Operating Temperature	°C (°F)	46 (115)					
Minimum Ambient Operating Temperature	°C (°F)	2 (35)					
Maximum System Temperature Setting	°C (°F)	109 (228)					
Nominal Power - Main Motor	kW (HP)	224 (300)					
Main Drive Efficiency (3)	Percent	97.7%					
Main Motor Efficiency (3)	Percent	95.4%					
Package Input Power - Air Cooled (4)	kW	272.7	281.5	281.5	281.5	281.5	281.5
Package Input Power - Water Cooled (4)	kW	~~256.3~~	~~265.1~~	~~265.1~~	~~265.1~~	~~265.1~~	~~265.1~~
Specific Power - Air Cooled (4)(5)	kW/m3/min (kW/100cfm)	5.93 (16.78)	6.29 (17.82)	6.45 (18.28)	6.73 (19.07)	6.92 (19.59)	6.98 (19.75)
~~Specific Power - Water Cooled~~ (4)(5)	~~kW/m3/min (kW/100cfm)~~	~~5.57 (15.77)~~	~~5.92 (16.78)~~	~~6.08 (17.21)~~	~~6.34 (17.96)~~	~~6.51 (18.45)~~	~~6.57 (18.6)~~
SOUND LEVEL (6)							
Standard Package - Air Cooled	dB(A)	80					
~~Standard Package - Water Cooled~~	~~dB(A)~~	~~80~~					
Cooling Data (115°F/46°C Maximum Ambient Temperature)							
Heat Removal Oil Cooler (@ 100°F / 38°C)	kW (1000 Btu/hr)	209 (714)	209 (714)	209 (714)	209 (714)	209 (714)	209 (714)
Heat Removal Oil and Aftercooler (@ 100oF / 38oC)	kW (1000 Btu/hr)	265 (904)	265 (904)	265 (904)	265 (904)	265 (904)	265 (904)
Maximum Added Static Pressure	Pa (in H_2O)	60 (0.25)					
Air-cooled							
Fan Air Flow	m³/min (cfm)	Maximum: 680 (24,000)					
Cooling Air Temperature Rise	°C (°F)	20 (36)	20 (36)	20 (36)	20 (36)	20 (36)	20 (36)
Aftercooler CTD (7)	°C (°F)	8.3 (15.0)	8.3 (15.0)	8.3 (15.0)	8.3 (15.0)	8.3 (15.0)	8.3 (15.0)
~~**Water-cooled - Standard Duty**~~							
~~Fan Air Flow~~	~~m³/min (cfm)~~	~~181 (6,400)~~					
~~Aftercooler CTD~~ (7)	~~°C (°F)~~	~~8.3 (15.0)~~	~~8.3 (15.0)~~	~~8.3 (15.0)~~	~~8.3 (15.0)~~	~~8.3 (15.0)~~	~~8.3 (15.0)~~
~~Cooling Water Flow~~							
~~@ 10°C (50°F)~~	~~l/min (gal/min)~~	~~114 (25)~~	~~114 (25)~~	~~114 (25)~~	~~114 (25)~~	~~114 (25)~~	~~114 (25)~~
~~@ 21°C (70°F)~~	~~l/min (gal/min)~~	~~158 (35)~~	~~158 (35)~~	~~158 (35)~~	~~158 (35)~~	~~158 (35)~~	~~158 (35)~~
~~@ 32°C (90°F)~~	~~l/min (gal/min)~~	~~246 (54)~~	~~246 (54)~~	~~246 (54)~~	~~246 (54)~~	~~246 (54)~~	~~246 (54)~~
~~@ 46°C (115°F)~~	~~l/min (gal/min)~~	~~350 (77)~~	~~350 (77)~~	~~350 (77)~~	~~350 (77)~~	~~350 (77)~~	~~350 (77)~~
~~Cooling Water Temperature Rise~~	~~°C (°F)~~	~~13 (23)~~	~~13 (23)~~	~~13 (23)~~	~~13 (23)~~	~~13 (23)~~	~~13 (23)~~
~~Cooling Air Temperature Rise~~	~~°C (°F)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~**Water-cooled - Harsh Duty**~~							
~~Fan Air Flow~~	~~m³/min (cfm)~~	~~N/A~~					
~~Aftercooler CTD~~ (8)	~~°C (°F)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~Cooling Water Flow~~							
~~@ 10°C (50°F)~~	~~l/min (gal/min)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~@ 21°C (70°F)~~	~~l/min (gal/min)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~@ 32°C (90°F)~~	~~l/min (gal/min)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~@ 46°C (115°F)~~	~~l/min (gal/min)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~Cooling Water Temperature Rise @ 30°C~~	~~°C (°F)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~Cooling Air Temperature Rise~~	~~°C (°F)~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~

Ingersoll Rand
Industrial Technologies

ENGINEERING DATA SHEET

R225NE

CCN: ~~23570773~~
Rev.: C
Sheet: 2 of 2
Date: 8-Mar-2010

CONSTRUCTION FOUNDATION AND MOUNTING DATA

PIPING CONNECTIONS

Air Discharge	Inches (150# ANSI Flange)	3.00
Package Automatic Condensate Drain	Inches NPT	0.50
Coolant Drain (if drain tube removed)	Inches BSPT	0.50
Diameter of Power Inlet	Inches	3.0"
~~Water Inlet and Outlet Connections~~	~~Inches BSPT/NPT~~ (9)	~~2.00~~

COOLANT LUBRICATION DATA

Total Coolant Capacity - Air Cooled	litres (US gal)	152 (40)
~~Total Coolant Capacity - Water Cooled - Std~~	~~litres (US gal)~~	~~152 (40)~~
~~Total Coolant Capacity - Water Cooled - Harsh~~	~~litres (US gal)~~	~~N/A~~

DIMENSIONS & WEIGHT

		Base Mounted
Length, Width, Height	mm (inches)	4000 / 1930 / 2146 (157.5 / 76 / 84.5)
Net Weight - Air Cooled	kg (lb.)	5933 (13080)
Net Weight - Water Cooled	kg (lb.)	5933 (13080)
GA Drawing Number - Air Cooled		23442502
GA Drawing Number - Water Cooled		23442510

ELECTRICAL DATA

		~~380V, 3Φ~~	460V, 3Φ	~~575V, 3Φ~~
Motor Protection			IP23 (ODP)	
Full Load Package Current - Air Cooled (10)	Amps	~~470~~	389	~~311~~
Full Load Package Current - Water Cooled (10)	Amps	~~428~~	~~354~~	~~283~~

Electrical Installation

Recommended Supply Cable Size (11)	mm²/Cu (AWG)	~~TBD~~	TBD	~~TBD~~
Recommended Fuse Rating (11)(12)	Amps	~~TBD~~	TBD	~~TBD~~

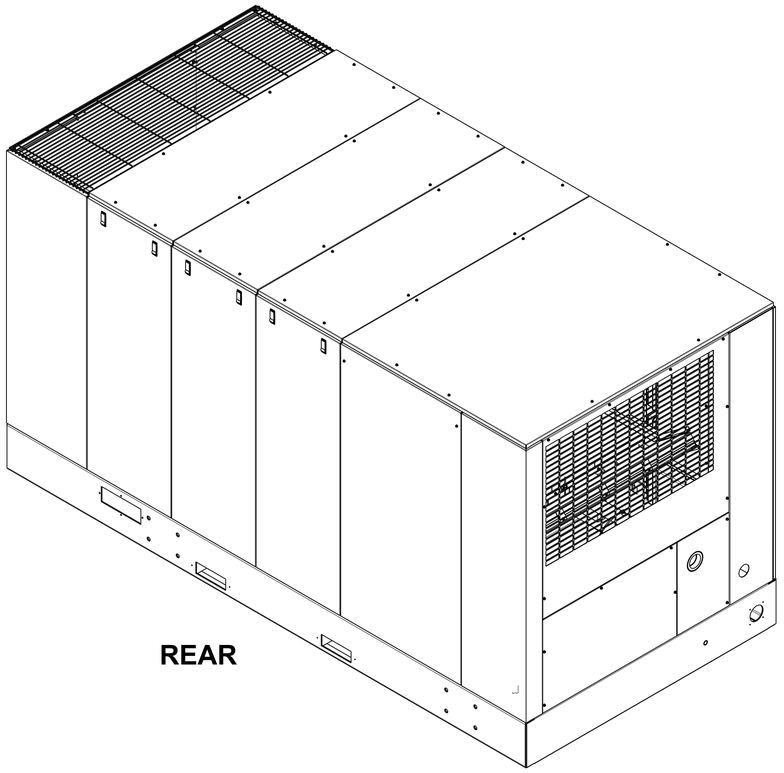
Notes :

(1) FAD (Free Air Delivery) is full package performance including all losses. Tested per ISO 1217 : 2009 Annex C
(2) Maximum pressure at package discharge, value at which compressor will stop when unit operating at maximum target pressure
(3) At maximum speed and flow for the given package discharge pressure
(4) Measured at rated capacity and rated pressure
(5) Specific power guaranteed in accordance with ISO 1217 : 2009 Annex C
(6) Measured in free field conditions per ISO 2151 using Hemispherical Method, with + 3 dB(A) tolerance.
(7) 40% Relative Humidity Inlet Air and maximum speed (For alternate conditions contact IR)
(8) Ambient temperature equivalent to cooling water inlet temperature
(9) BSPT or NPT, depending on regional standard
(10) Maximum current could exceed this value by up to 10% assuming fouled filters and elements
(11) Always apply local electrical codes for sizing cables and fusing.
(12) Fast Acting Class-J, T or Semiconductor type fuse required. Apply local electrical codes for fuse sizing

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
	A	77960	ORIGINAL RELEASE	2009OCT02	R. REDMON	G.F.
1-B8 2-D5 2-A8 2-A5	B	79364	UPDATED NOTE 19. REMOVED AIR DISCHARGE NOTE. DIM 732[28.8] WAS 726[28.6] AND DIM 1302[51.3] WAS 1296[51.0]. REMOVED DIM 63.1[2.49].	2011JAN13	C.NAGARAJA	G.FEE
2-C5	C	81684	UPDATED THE DRAWING TO LATEST FORMAT ADDED DOOR OPERATING RADIUS 579 [22.8]	2013JUN18	T.SRINIVAS	T.VINCENT

NOTES :

1. WEIGHT, APPROXIMATE : 5933 KG (13,080 LBS)
2. COOLING AIR FLOW : 680 M^3/MIN (24000 CFM)
3. PIPE CONDENSATE DRAIN LINES SEPARATELY TO AN OPEN DRAIN DUE TO DIFFERENCES IN DRAIN PRESSURE. USE DRAIN LINES AT LEAST AS LARGE AS THE CONNECTION. READ OPERATIONS MANUAL AND CHECK LOCAL REGULATIONS.
4. LUBE OIL FILL QUANTITY : DRY- 152 L (40 GAL)
   TANK ONLY - 61 L (16 GAL).
5. ALL DIMENSIONS IN MILLIMETERS (INCHES).
6. TOLERANCE ON ALL DIMENSIONS ±6 MM (±.25 INCH)
7. RECOMMENDED CLEARANCE ON THREE SIDES 915 MM (36 INCHES) SIDE WITH ELECTRICAL BOX 1067 MM (42 INCHES) OR MINIMUM AS REQUIRED BY LATEST NATIONAL ELECTRICAL CODE OR APPLICABLE LOCAL CODES.
8. EXTERNAL PIPING SHOULD NOT EXERT ANY UNRESOLVED MOMENTS OR FORCES ON UNIT. USE PIPE OF EQUAL OR GREATER SIZE AT DISCHARGE LOCATION OF UNIT.
9. THERE SHOULD BE NO PLASTIC OR PVC PIPING ATTACHED TO THIS UNIT OR USED FOR ANY LINES DOWNSTREAM.
10. REMOVE THE ISOLATION MOUNT RESTRAINTS BEFORE THE INITIAL START THE TWO RESTRAINTS CAN BE DISCARDED.
11. FIELD INSTALLED DUCTING TO AND FROM COMPRESSOR CANNOT ADD MORE THAN 6MM (.25 INCH) OF WATER TOTAL AIR RESISTANCE.
12. UNIT HAS AN INTERNAL DISCHARGE CHECK VALVE. EXTERNAL CHECK VALVE NOT REQUIRED. ISOLATION VALVE RECOMMENDED.
13. COMPRESSOR SHOULD BE BOLTED TO THE FLOOR WITH FOUR M12 (1/2 INCH) BOLTS USING HOLES SHOWN ON SHEET 3. SEAL BASE TO FLOOR WITH CORK OR RUBBER.
14. DO NOT PIPE INTO A COMMON HEADER WITH A RECIPROCATING COMPRESSOR. UNLESS RECIP COMPRESSOR UTILIZES A DISCHARGE PULSATION DAMPNER.
15. ⌖ DENOTES CENTER OF GRAVITY.
16. SIZING OF ELECTRICAL COMPONENTS NOT SUPPLIED BY INGERSOLL-RAND IS THE RESPONSIBILITY OF THE CUSTOMER AND SHOULD BE DONE IN ACCORDANCE WITH THE INFORMATION ON THE COMPRESSOR DATA PLATE, NATIONAL AND LOCAL ELECTRIC CODES.
17. A ∅ 75MM (3 INCHES) ELECTRICAL POWER INLET CONNECTION HOLE IS PROVIDED INSIDE OF ELECTRICAL BOX AS INDICATED. SIZE AND POSITIONING CAN BE CHANGED BY CUSTOMER IN ACCORDANCE WITH NOTE 16.
18. WHEN INSTALLED INDOORS IN A CONFINED SPACE, THE COOLING AIR INLET OR EXHAUST MUST BE DUCTED AWAY FROM UNIT TO PREVENT RECIRCULATION OF HOT EXHAUST AIR.
19. CONNECTIONS :
    A. DISCHARGE AIR: 3 INCH NPT FEMALE (NON-EU)
       3 INCH BSPT FEMALE (EU)
    B. ELECTRICAL CONNECTIONS: ∅ 75MM (3 INCHES)
    C. CONDENSATE DRAIN: .5 INCH BSPT (FEMALE) SEE NOTE 3
20. FORK LIFT COVERS MUST BE INSTALLED AFTER UNIT IS IN PLACE.
21. SEPARATOR ELEMEMT :
    MINIMUM CLEARANCE REQUIRED FOR REMOVAL ABOVE TOP OF UNIT IS 18.00 INCHES (457 MM).



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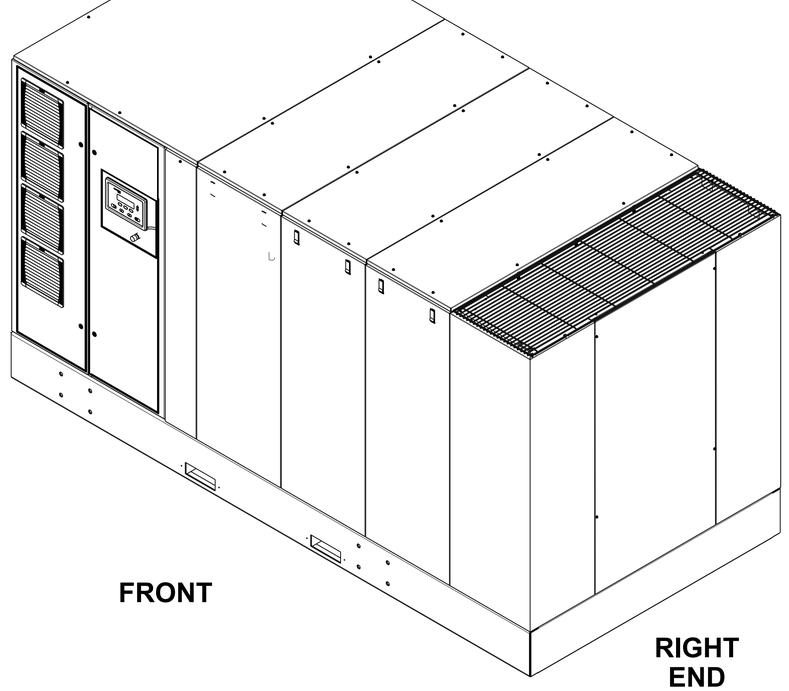
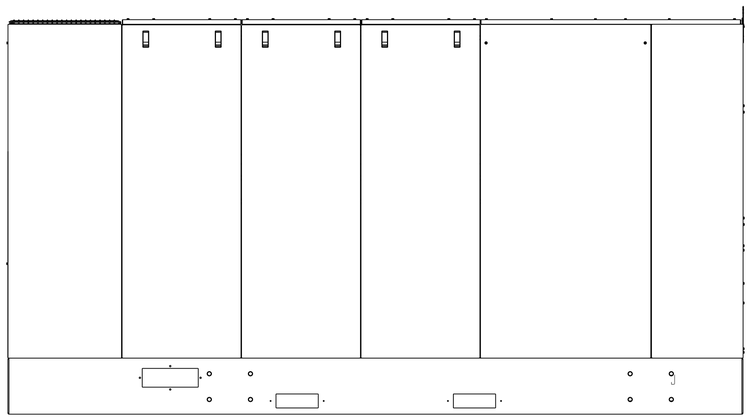


FRONT

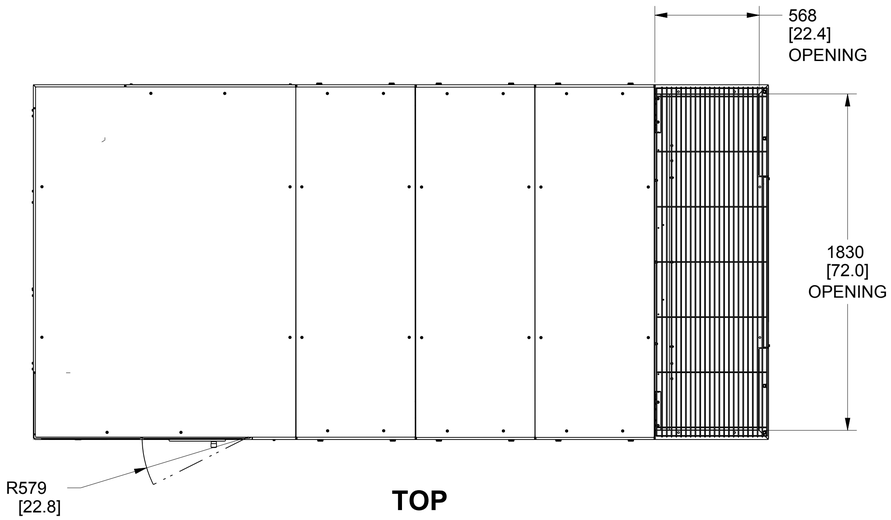
RIGHT END

STANDARD TOLERANCES	WARNING: THE EXPORT OR REEXPORT OF THIS DRAWING OR A PRODUCT PRODUCED BY THIS DRAWING IS SUBJECT TO U.S. EXPORT ADMINISTRATION REGULATIONS AND OTHER APPLICABLE GOVERNMENT RESTRICTIONS OR REGULATIONS.	DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	Ingersoll Rand
ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]	PROPRIETARY NOTICE	DRAWING CONFORMS TO ASME Y14.5M - 1994	DRAWN R. REDMOND 2009OCT02 CHECKED S. EATON 10/2/09 APPROVED G. FEE 10/2/09	TITLE: GENERAL ARRANGEMENT R190-225NE (AIR COOLED)
UNSPECIFIED TOLERANCES: WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0.25 ANGLES (.X) : ± 1°	THIS DRAWING CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION, IS THE PROPERTY OF INGERSOLL-RAND CO., AND IS GIVEN TO THE RECEIVER IN CONFIDENCE. THE RECEIVER BY RECEPTION AND RETENTION OF THE DRAWING ACCEPTS THE DRAWING IN CONFIDENCE AND AGREES THAT, EXCEPT AS AUTHORIZED IN WRITING BY INGERSOLL-RAND CO. IT WILL (1) NOT USE THE DRAWING OR ANY COPY THEREOF OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; (2) NOT COPY THE DRAWING; (3) NOT DISCLOSE TO OTHERS EITHER THE DRAWING OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; AND (4) UPON COMPLETION OF THE NEED TO RETAIN THE DRAWING, OR UPON DEMAND, RETURN THE DRAWING, ALL COPIES THEREOF, AND ALL MATERIAL COPIED THEREFROM.	UNLESS OTHERWISE SPECIFIED: - REMOVE ALL BURRS AND SHARP CORNERS - WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4	DRAWING TYPE: General Arrangement Drawing NOMENCLATURE	SIZE: A1 · ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED): 0.0 kilogram · DWG NO.: 23442510 · REV: C SCALE: 0.12 · UNIT: R190-225NE · SHEET: 1 OF 3
Ingersoll-Rand Industrial Technologies		COPYRIGHT @ 2013 Ingersoll Rand ALL RIGHTS RESERVED		



REAR VIEW

INLET AIRFLOW



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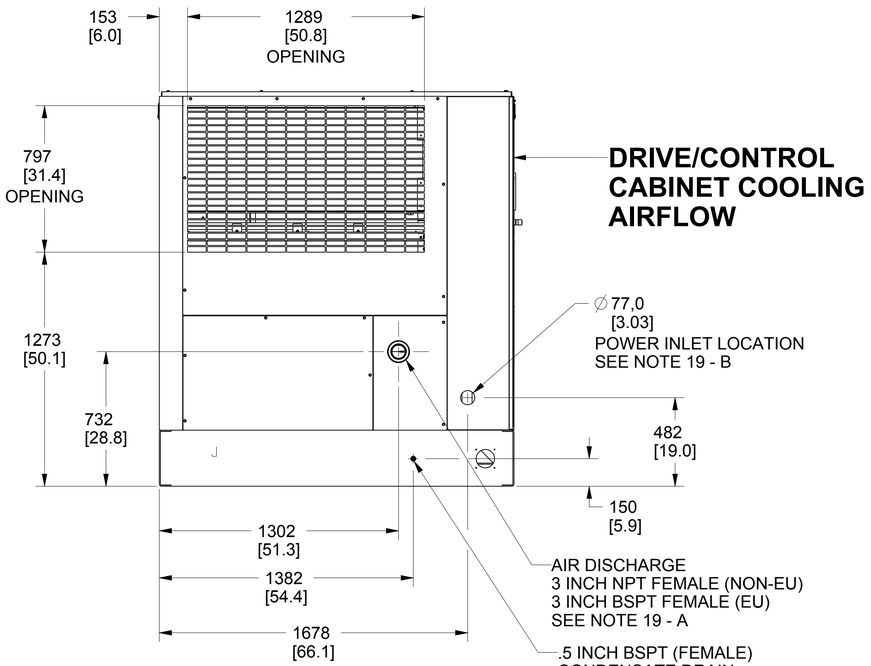

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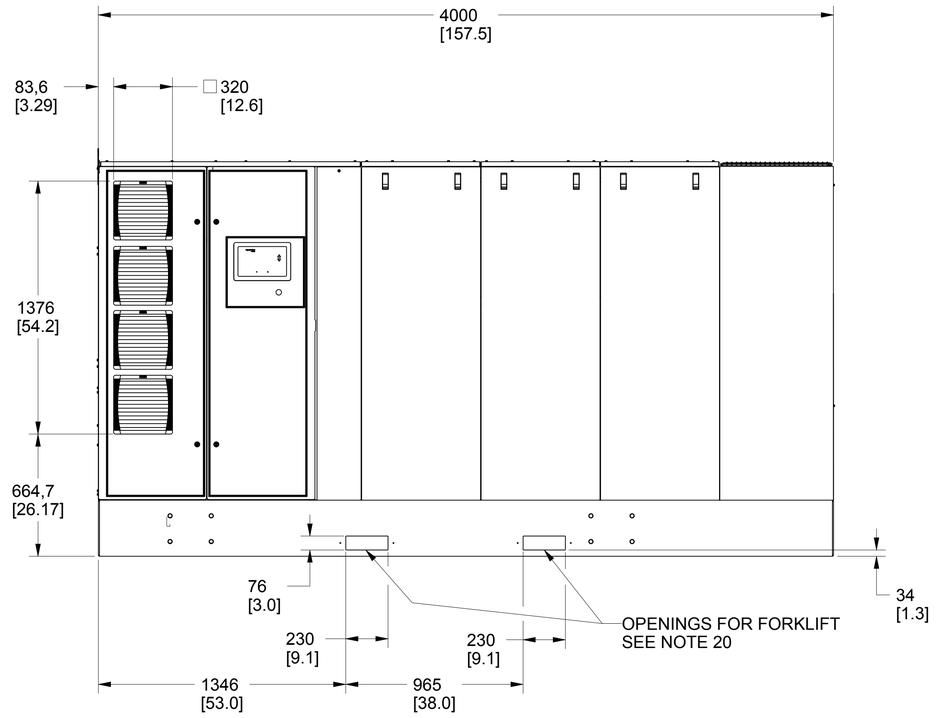
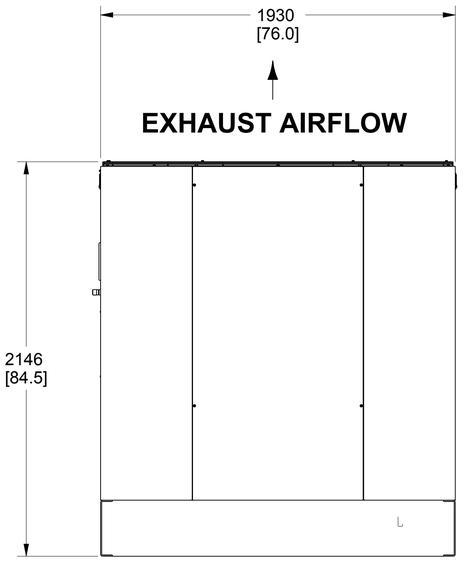


FRONT



RIGHT

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TITLE
GENERAL ARRANGEMENT R190-225NE (AIR COOLED)

SIZE	DWG NO.	REV.
A1	23442510	C

SCALE: 0.06 SHEET 2 OF 3

6/18/2015
Page 32 of 174

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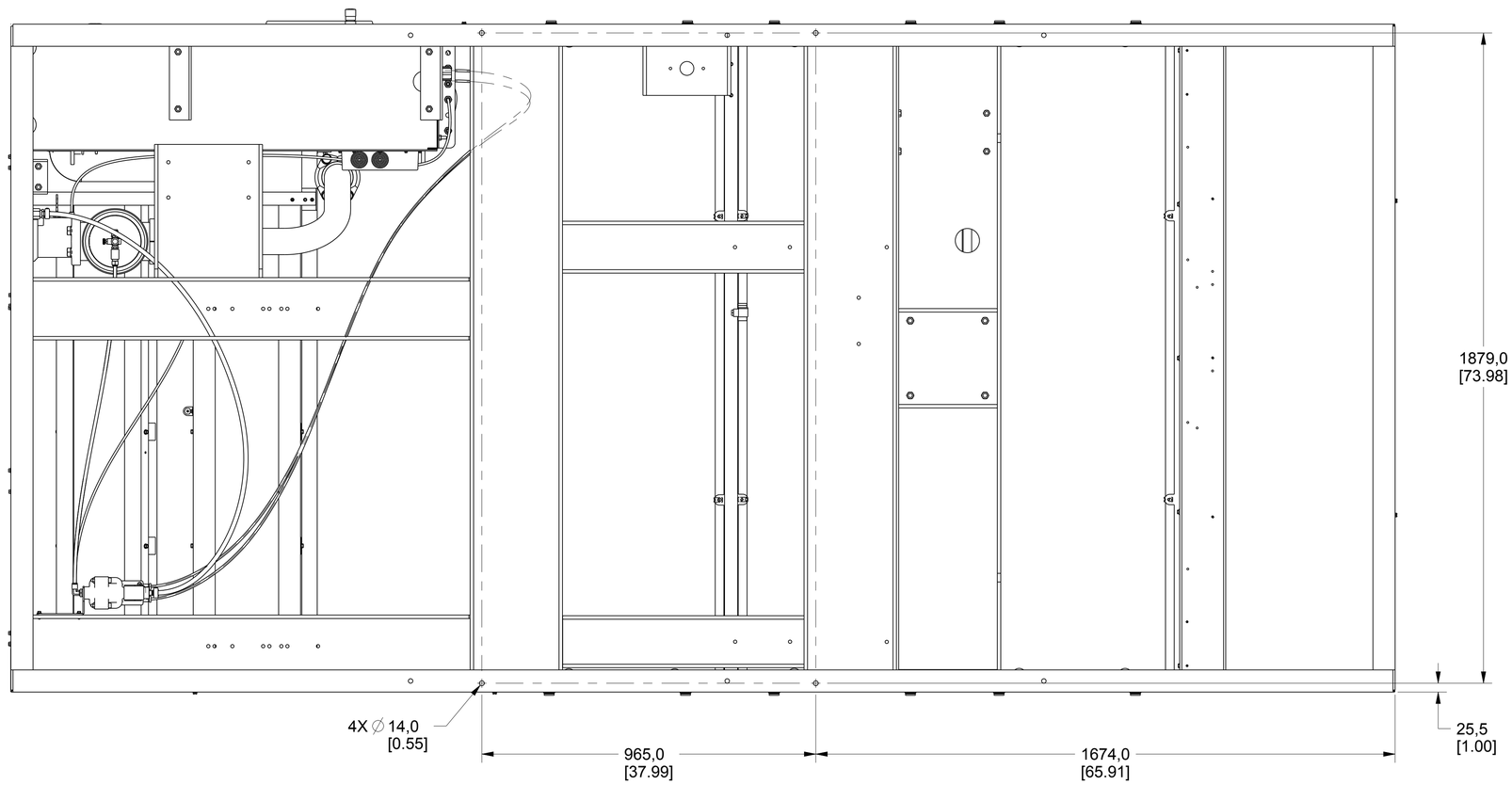

BOTTOM VIEW

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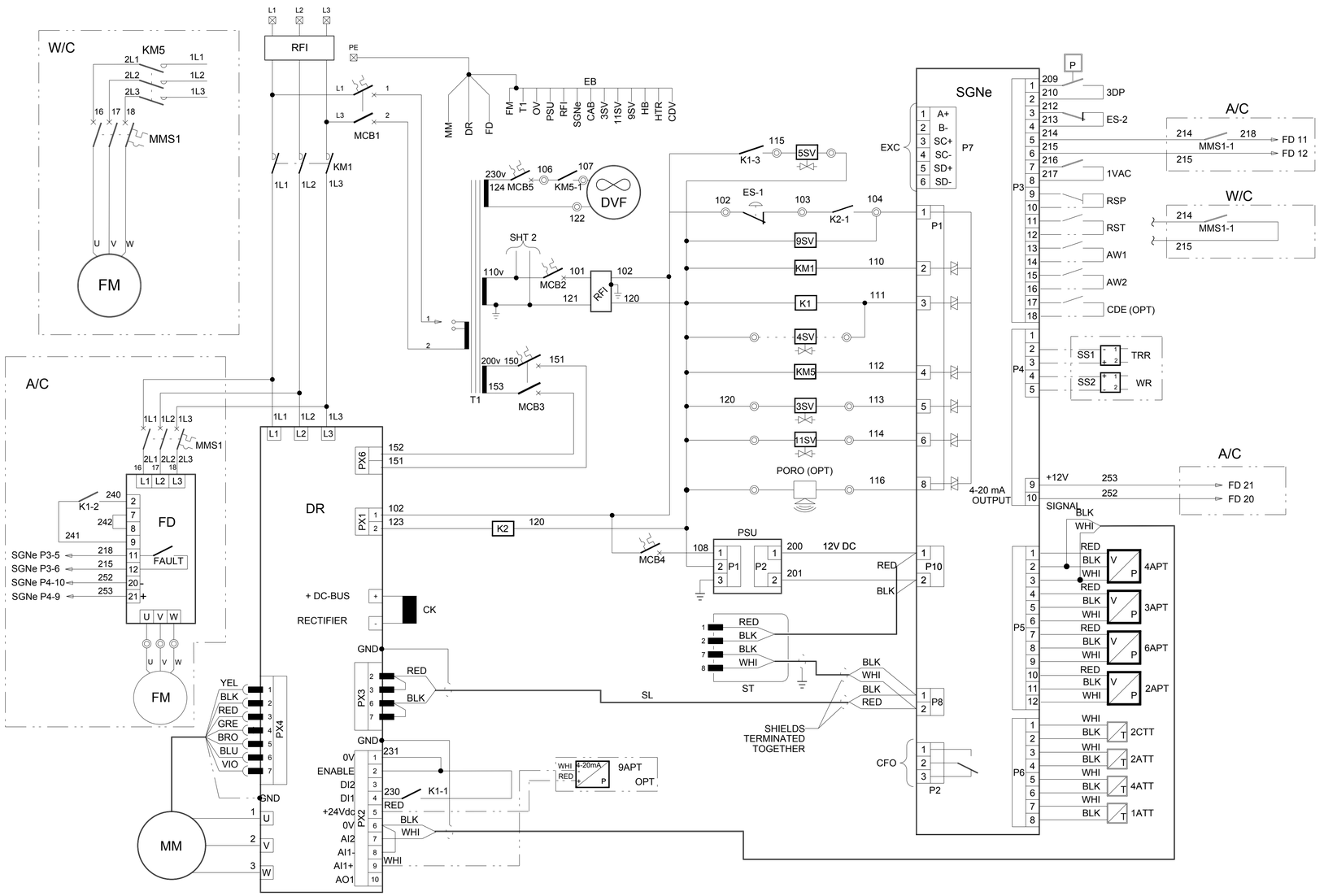
TITLE
GENERAL ARRANGEMENT
R190-225NE (AIR COOLED)

SIZE	DWG NO.	REV.
A1	23442510	C
SCALE: 0.12	SHEET 3 OF 3	

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
-	A	77960	ORIGINAL RELEASE	2009JUL07	S.DIETRICH	G.FEE
B5	B	77960	ADDED GROUND AND SHIELD NOTE AT P8	2009OCT07	R. REDMON	G.FEE
1-C5 2-D7	C	77960	REMOVED 9SV, REMOVED 1-STG & 2-STG ONLY, REMOVED OPT FROM CDV.	2009OCT12	R. REDMON	G.FEE
	D	78505	PORO MOVED FROM P4-5/6 TO P1-8. SOLID STATE RELAY SS3 REMOVED ADDED 1L1, 1L2, 1L3 IDENTIFICATION AT KM1 REMOVED 1-ATS	2010MAR04	C.NAGARAJA	G.FEE
1-D5	E	78686D	ADDED CONDENSATE DRAIN VALVE 9SV.	2010MAY21	H.AVINASH	G.FEE
1-C8 1-D7 1-D3 1-D3	F	79254	LINE TO FD11: 218 WAS 214. ADDED LABEL: RFI. REMOVED MMS2-1. ADDED A/C AT FD11 & FD12, ADDED W/C OPTION.	2010NOV17	R. REDMON	
1-D4 3-D8	G	81299	UPDATED DRAWING FORMAT 3DP WAS 1DPS LEAD 209 WAS 210 LEAD 210 WAS 211 IN TABLE LABEL 3DP WAS 1DPS	2012NOV27	W.SORAH	J.DAVIS

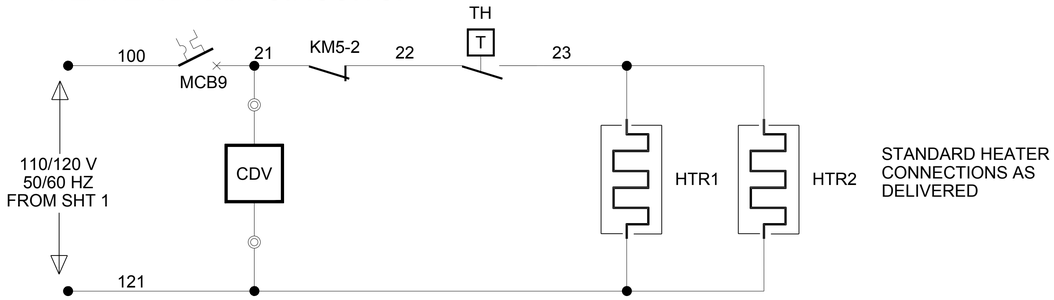


23487952 REV G
SHEET 1 OF 3

NOTE: DECAL MUST CONFORM TO THE LATEST REVISION OF I-R SPEC. 92-8.95

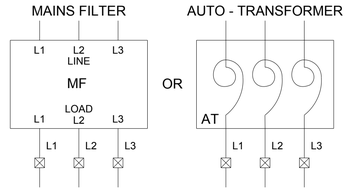
STANDARD TOLERANCES ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)] UNSPECIFIED TOLERANCES: WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0.25 ANGLES (.X) : ± 1° Ingersoll-Rand Industrial Technologies	WARNING: THE EXPORT OR REEXPORT OF THIS DRAWING OR A PRODUCT PRODUCED BY THIS DRAWING IS SUBJECT TO U.S. EXPORT ADMINISTRATION REGULATIONS AND OTHER APPLICABLE GOVERNMENT RESTRICTIONS OR REGULATIONS. PROPRIETARY NOTICE THIS DRAWING CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION, IS THE PROPERTY OF INGERSOLL-RAND CO., AND IS GIVEN TO THE RECEIVER IN CONFIDENCE. THE RECEIVER BY RECEPTION AND RETENTION OF THE DRAWING ACCEPTS THE DRAWING IN CONFIDENCE AND AGREES THAT, EXCEPT AS AUTHORIZED IN WRITING BY INGERSOLL-RAND CO. IT WILL (1) NOT USE THE DRAWING OR ANY COPY THEREOF OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; (2) NOT COPY THE DRAWING; (3) NOT DISCLOSE TO OTHERS EITHER THE DRAWING OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; AND (4) UPON COMPLETION OF THE NEED TO RETAIN THE DRAWING, OR UPON DEMAND, RETURN THE DRAWING, ALL COPIES THEREOF, AND ALL MATERIAL COPIED THEREFROM.	DO NOT SCALE DRAWING DRAWING CONFORMS TO ASME Y14.5M - 1994 CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED UNLESS OTHERWISE SPECIFIED: - REMOVE ALL BURRS AND SHARP CORNERS - WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4 COPYRIGHT @ 2012 Ingersoll Rand ALL RIGHTS RESERVED	THIRD ANGLE PROJECTION DRAWN S.DIETRICH 2009JUL02 CHECKED T.VINCENT 2009JUL08 APPROVED G.FEE 2009JUL08 DRAWING TYPE: Detail Drawing NOMENCLATURE	Ingersoll Rand TITLE: DECAL, WIRING SCHEMATIC R190-225NE SIZE A1 · ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED) 0.0 kilogram · DWG NO. 23487952 · REV G SCALE: 0.20 · UNIT: R190-225NE · SHEET 1 OF 3

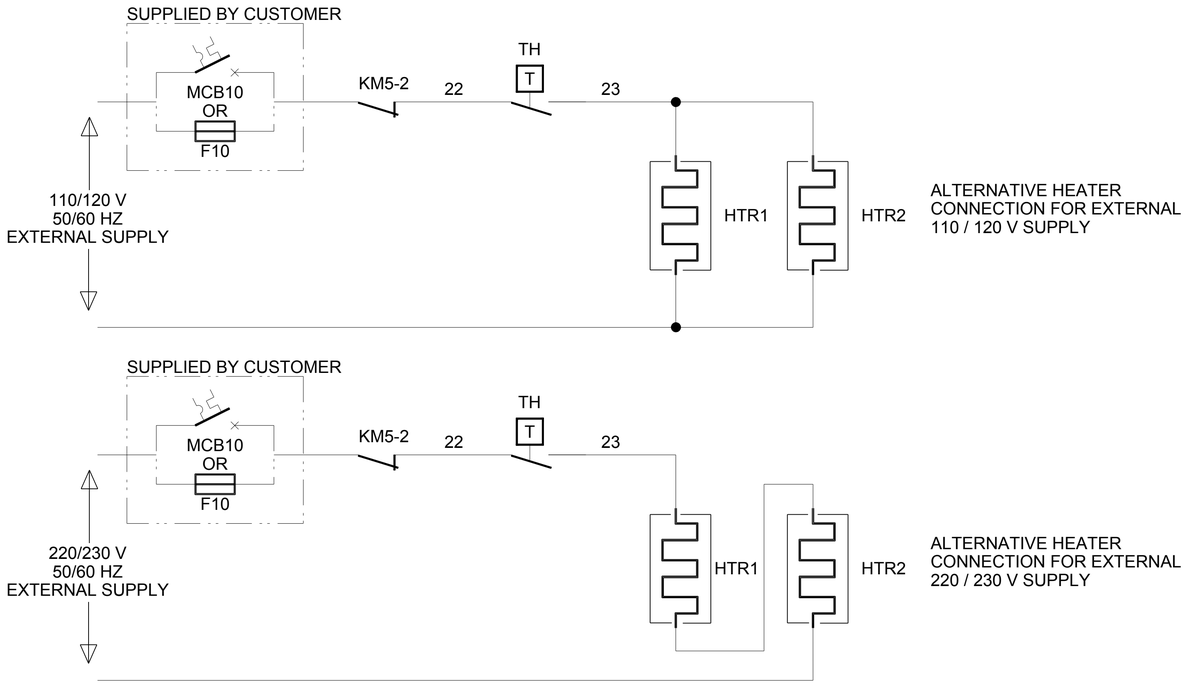
HEATER/DRAIN CIRCUITS:-



STANDARD HEATER CONNECTIONS AS DELIVERED

MAIN INPUT TERMINALS OPTIONS





ALTERNATIVE HEATER CONNECTION FOR EXTERNAL 110 / 120 V SUPPLY

ALTERNATIVE HEATER CONNECTION FOR EXTERNAL 220 / 230 V SUPPLY

23487952 REV G
SHEET 2 OF 3

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TITLE
DECAL, WIRING SCHEMATIC
R190-225NE

SIZE	DWG NO.	REV
A1	23487952	G
SCALE: 0.20	SHEET	2 OF 3

LABEL	DESCRIPTION	LABEL	DESCRIPTION
1ATT	SENSOR, INLET TEMPERATURE	MCB1	BREAKER, MINIATURE CIRCUIT, TRANSFORMER
3DP	SWITCH, FOULED OIL FILTER	MCB2	BREAKER, MINIATURE CIRCUIT, CONTROL CIRCUITS
1VAC	SWITCH, FOULED AIR FILTER	MCB3	BREAKER, MINIATURE CIRCUIT, DR
2APT	SENSOR, INTERSTAGE PRESSURE	MCB4	BREAKER, MINIATURE CIRCUIT, PSU
2ATT	SENSOR, AIREND DISCHARGE TEMPERATURE	MCB9	BREAKER, MINIATURE CIRCUIT, HEATER
2CTT	SENSOR, INJECTED COOLENT TEMPERATURE	MCB10	BREAKER, MINIATURE CIRCUIT, HEATER (EXTERNAL)
3APT	TRANSDUCER, SUMP PRESSURE, WET SIDE	MF	MAINS FILTER
3SV	VALVE, BLOWDOWN SOLENOID	MM	MOTOR, MAIN
4APT	TRANSDUCER, PACKAGE AIR DISCHARGE PRESSURE	MMS1	BREAKER, FAN MOTOR
4ATT	SENSOR, PACKAGE AIR DISCHARGE TEMPERATURE	OPT	OPTIONAL
5SV	VALVE, COOLANT STOP	OV	ZERO VOLTAGE
6APT	TRANSDUCER, SUMP AIR PRESSURE, DRY SIDE	PE	PROTECTIVE EARTH
9APT	TRANSDUCER, REMOTE AIR PRESSURE (OPTIONAL)	PORO	POWER OUTAGE RESTART OPTION (OPTIONAL)
9SV	VALVE, CONDENSATE DRAIN	PSU	POWER SUPPLY UNIT
11SV	VALVE, ANTI-CONDENSATION SOLENOID 1	RFI	FILTER, RADIO FREQUENCY INTERFERENCE
A/C	AIR COOLED OPTION	RSP	REMOTE STOP
AT	AUTOTRANSFORMER (IF FITTED)	RST	REMOTE START
AW1	AUXILIARY WARNING 1	SGNe	CONTROLLER, INTELLISYS
AW2	AUXILIARY WARNING 2	SL	SERIAL LINK
BP	BACKPLATE	SS1-2	RELAY, SOLID STATE
C	CAPACITOR	ST	SERVICE TOOL
CAB	CABINET	T1	TRANSFORMER, CONTROL
CDE	CONDENSATE DRAIN ERROR (OPTIONAL)	TH	THERMOSTAT
CDV	CONDENSATE DRAIN VALVE (IF FITTED)	TRR	TRUE RUNNING
CFO	COMMON FAULT OUTPUT	W/C	WATER COOLED OPTION
CK	CHOKE	4SV	VALVE, WATER STOP (W/C OPTION ONLY)
DR	DRIVE		
DVF	FAN, DRIVE VENTILATION		
EB	EARTH BAR		
ES	SWITCH, EMERGENCY STOP		
EXC	EXTERNAL COMMUNICATIONS		
F10	FUSE, EXTERNAL HEATER SUPPLY		
FD	FAN DRIVE		
FM	MOTOR, BLOWER		
GND	GROUND		
HTR1	HEATER, 125 WATTS		
K1	RELAY, RUN		
K2	RELAY, FAULT		
KM1	CONTACTOR, MAIN MOTOR		
KM5	CONTACTOR, HEATSINK BLOWER		

COLOURS

LABEL	
BLK	BLACK
BLU	BLUE
BRO	BROWN
GRE	GREEN
PIN	PINK
RED	RED
SCR	SCREEN
VIO	VIOLET
WHI	WHITE
YEL	YELLOW

WIRES

NUMBERS	FUNCTION	WIRE COLOUR
1-99	POWER	BLACK
100-199	AC CONTROL	RED
200-299	DC CONTROL	BLUE
300-399	AUXILIARY	ORANGE

23487952 REV G
SHEET 3 OF 3

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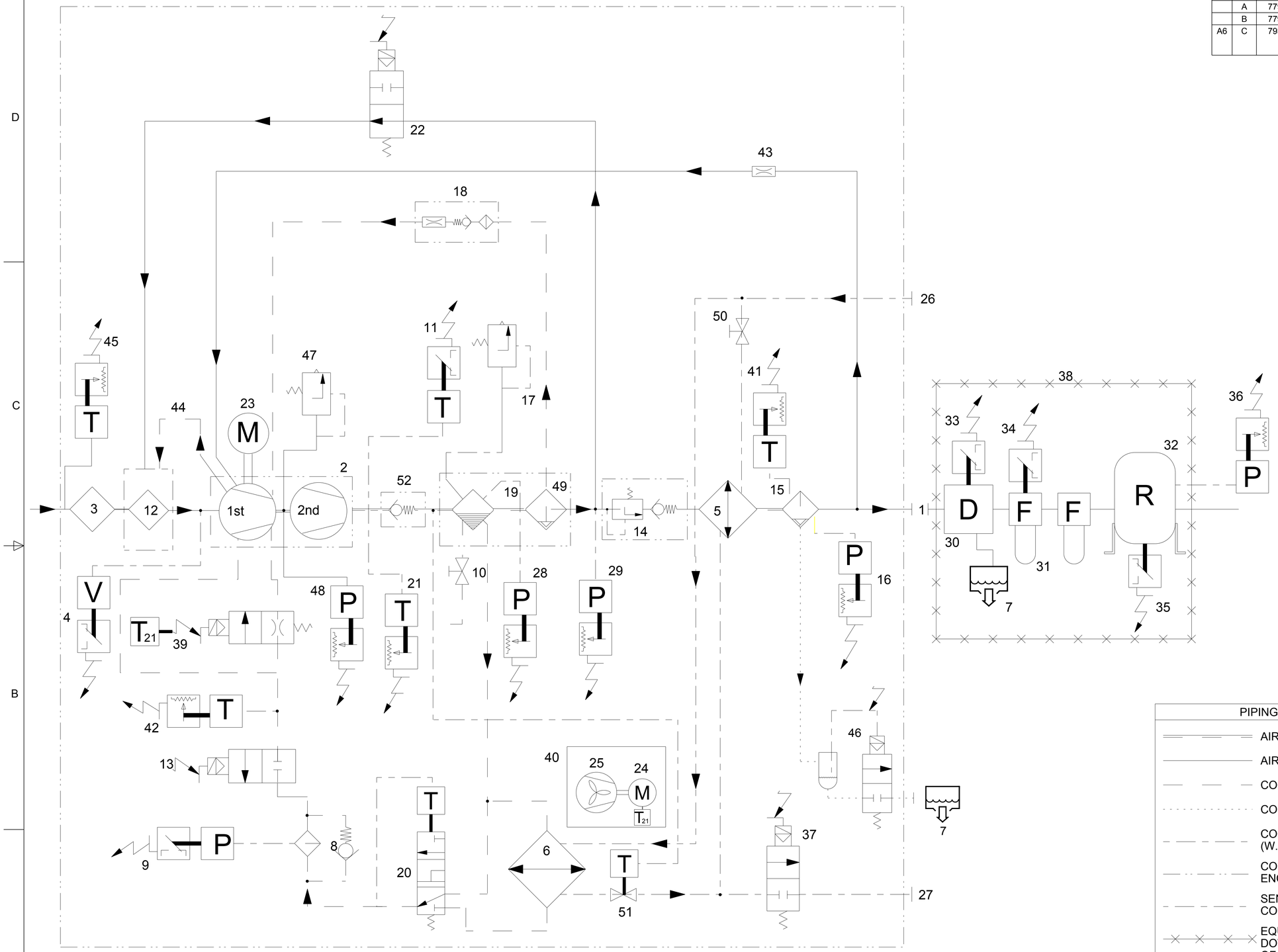
TITLE
DECAL, WIRING SCHEMATIC
R190-225NE

SIZE	DWG NO.	REV
A1	23487952	G
SCALE: 0.20		SHEET 3 OF 3

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
	A	77960	ORIGINAL RELEASE	2009JUL02	S.DIETRICH	G.FEE
	B	77960	UNIT NOMENCLATURE WAS R200-225eNU	2009OCT07	G.FEE	G.FEE
A6	C	79364	TEMP CONTROL VALVE LOCATION (ITEM 51) CHANGED INTO WATER OUT LEG GROUP FROM OIL COOLER WATER IN LEG GROUP.	2011JAN10	C.NAGARAJA	G.FEE



PIPING LEGEND
AIR/COOLANT
AIR
COOLANT
CONDENSATE
COOLING WATER (W.C. ONLY)
COMPRESSOR ENCLOSURE
SENSOR CONNECTION
EQUIPMENT DOWNSTREAM OF COMPRESSOR

DIAGRAM POSITION	DESCRIPTION
	KEY TO COMPONENT
52	AIREND DISCHARGE CHECK VALVE
51	VALVE, A/E DISCHARGE TEMP CONTROL (W.C. ONLY)
50	VALVE, AFTERCOOLER TRIM (W.C. ONLY)
49	AIR/COOLANT SEPARATOR ELEMENT
48	INTERSTAGE PRESSURE TRANSDUCER (TWO STAGE)
47	INTERSTAGE PRESSURE RELIEF VALVE (TWO STAGE)
46	ELECTRONIC DRAIN TRAP
45	PACKAGE INTAKE AIR TEMPERATURE SENSOR 1ATT
44	SEAL SCAVENGE LINE DRAIN
43	ORIFICE, SEAL SCAVENGE AIR SUPPLY
42	INJECTED COOLANT TEMPERATURE SENSOR 2CTT
41	PACKAGE DISCHARGE AIR TEMPERATURE SENSOR 4ATT
40	COOLING AIR EXHAUST
39	ANTI-CONDENSATION VALVE 11SV
38	TYPICAL CUSTOMER DOWNSTREAM AIR TREATMENT
37	WATER SHUTOFF VALVE 4SV (W.C.ONLY)
36	REMOTE AIR PRESSURE TRANSDUCER 9APT (OPTIONAL)
35	RECEIVER TRAP AUX WARNING | AW1 (WIRE IN SERIES)
34	LINE FILTER AUX WARNING | AW1 (WIRE IN SERIES)
33	DRYER AUX WARNING | AW1 (WIRE IN SERIES)
32	RECEIVERS (CUSTOMER EQUIPMENT)
31	LINE FILTERS (CUSTOMER EQUIPMENT)
30	DRYER (CUSTOMER EQUIPMENT)
29	PRESSURE TRANSDUCER 6APT (DRY)
28	PRESSURE TRANSDUCER 3APT (WET)
27	COOLING WATER OUTLET (W.C. ONLY)
26	COOLING WATER INLET (W.C. ONLY)
25	COOLING AIR FAN
24	MOTOR, BLOWER - VARIABLE SPEED (A.C. ONLY)
23	DRIVE MOTOR - VARIABLE SPEED
22	BLOWDOWN SOLENOID VALVE 3SV
21	TEMPERATURE SENSOR 2ATT
20	OIL TEMPERATURE CONTROL VALVE
19	SEPARATOR TANK (PRIMARY/SECONDARY)
18	SCAVENGE FILTER / ORIFICE / CHECK VALVE
17	PRESSURE RELIEF VALVE
16	PRESSURE TRANSDUCER 4APT
15	MOISTURE SEPARATOR
14	MINIMUM PRESSURE CHECK VALVE
13	COOLANT STOP SOLENOID VALVE 5SV
12	AIR INLET/ADAPTER
11	HIGH AIR TEMPERATURE SWITCH 1ATS
10	DRAIN VALVE, COOLANT
9	PRESSURE SWITCH, COOLANT FILTER 1DPS
8	COOLANT FILTER (S)
7	CONDENSATE DISCHARGE
6	COOLER, COOLANT
5	COOLER, AIR
4	VACUUM SWITCH 1VAC
3	AIR FILTER
2	COMPRESSOR
1	AIR DISCHARGE

STANDARD TOLERANCES
ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]
UNSPECIFIED TOLERANCES: WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0.25 ANGLES (.X) : ± 1 °
Ingersoll-Rand Industrial Technologies

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THIRD ANGLE PROJECTION

		DATE
DRAWN	S.DIETRICH	2009JUL02
CHECKED	T.VINCENT	2009JUL08
APPROVED	G.FEE	2009JUL06

Ingersoll Rand

TITLE: **DIAGRAM, PIPING & INST R190-225NE**

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO.	REV
A1	0.0	23487978	C
SCALE: 1.000	UNIT: R190-225NE	SHEET 1 OF 1	

6/18/2015
Page 37 of 174

Ingersoll Rand

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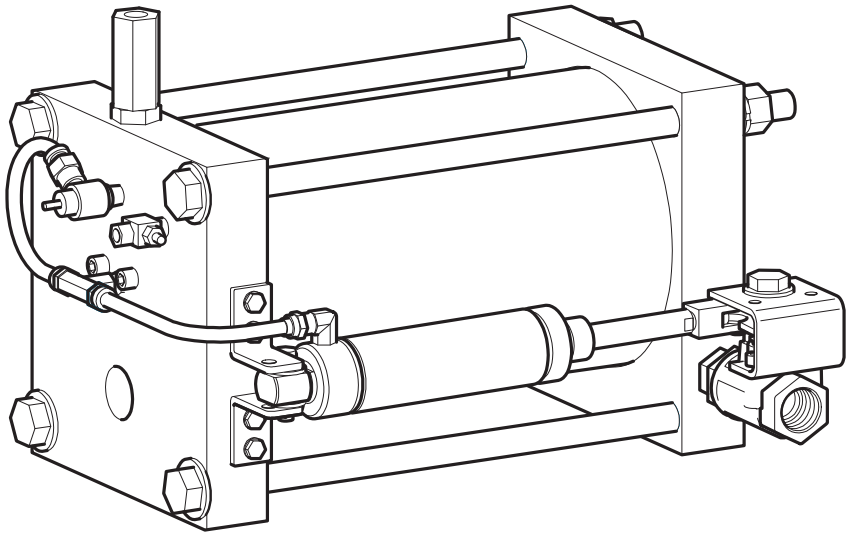

CCN 22699706 - NPT

CCN 38444345 - BSP

en	INSTALLATION INSTRUCTIONS.
fr	INSTRUCTIONS D'INSTALLATION.
nl	INSTRUCTIES VOOR INSTALLATIE.
de	INSTALLATIONSANLEITUNG.
pt	INSTRUÇÕES DE INSTALAÇÃO.
it	ISTRUZIONI PER L'INSTALLAZIONE.
es	INSTRUCCIONES DE INSTALACIÓN.
da	INSTALLATIONSINSTRUKTIONER.
sv	INSTALLATIONSBESKRIVNING.
no	INSTALLERINGSINSTRUKSJONER.
fi	ASENNUSOHJEET.
el	ΟΔΗΓΙΕΣ ΕΓΚΑΤΑΣΤΑΣΗΣ.
et	PAIGALDUSJUHISED.
lv	UZSTĀDĪŠANAS INSTRUKCIJAS.
lt	MONTAVIMO INSTRUKCIJOS.
pl	INSTRUKCJE INSTALACJI.
sk	INŠTRUKCIE K INŠTALÁCII.
cs	POKYNY K INSTALACI.
sl	NAVODILA ZA NAMESTITEV.
hu	TELEPÍTÉSI UTASÍTÁSOK.
mt	STRUZZJONIJIET TA' L-INSTALLAZZJONI.
ru	ИНСТРУКЦИИ ПО МОНТАЖУ.
zh	安装说明

C.C.N□ 22810568
DATE□ JANUARY 2006
REV□ : A

Machine models represented in this manual may be used in various locations world-wide. Machines sold and shipped into European Union Territories require that the machine display the EC Mark and conform to various directives. In such cases, the design specification of this machine has been certified as complying with EC directives. Any modification to any part is absolutely prohibited and would result in the CE Certification and marking being rendered invalid. A declaration of that conformity follows:

Les modèles de machines représentés dans ce manuel peuvent être utilisés dans divers pays du monde. Les machines vendues et expédiées dans les Pays de l'Union Européenne doivent porter la Marque EC et doivent être conformes aux diverses directives. Dans ce cas, la spécification de cette machine a été certifiée comme étant conforme aux directives EC. Toute modification d'une pièce est absolument interdite et rendrait invalide la Certification et le Marquage CE. Une déclaration de conformité suit :

De machines die in deze handleiding worden beschreven, kunnen op verschillende plaatsen in de wereld worden gebruikt. De machines die verkocht zijn en getransporteerd worden naar de Europese Unie moeten voorzien zijn van de EG-markering en moeten voldoen aan de betreffende richtlijnen. In dergelijke gevallen is de ontwerpspecificatie gecertificeerd als zijnde conform aan EG-richtlijnen. Aanpassingen van welke aard dan ook zijn niet toegestaan en zouden resulteren in het ongeldig verklaren van de EG-certificatie en -markering. Hieronder volgt een verklaring van deze conformiteit:

Die in diesem Dokument beschriebenen Maschinenmodelle können an verschiedenen Standorten weltweit verwendet werden. Maschinen, die in Länder der Europäischen Union ausgeliefert werden, müssen das EC-Zeichen aufweisen und einer Reihe von Richtlinien entsprechen. In diesen Fällen wurde die Konstruktion der Maschine gemäß EC-Richtlinien zertifiziert. Jede Veränderung von Teilen ist unzulässig und bewirkt die Ungültigkeit der CE-Zertifizierung und -Kennzeichnung. Die Konformitätserklärung folgt nachstehend:

CE

EC DECLARATION OF CONFORMITY WITH EC DIRECTIVES
DECLARATION DE CONFORMITE AVEC LES DIRECTIVES DE L'UNION EUROPEENNE (EC)
EG-CONFORMITEITSVERKLARING MET EG-RICHTLIJNEN
EC-ERKLÄRUNG DER KONFORMITÄT MIT DEN EC-RICHTLINIEN

97/23/EC, 98/37/EC

We, / nous, / Wij, / wir,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

declare that, under our sole responsibility for manufacture and supply, the product(s)
déclarons que, étant seuls responsables de la fabrication et de la fourniture, le produit
verklaren dat, onder onze volle verantwoordelijkheid voor productie en levering, het product
erklären im Rahmen unserer alleinigen Verantwortung für die Herstellung und Lieferung, dass das Produkt/die Produkte

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to which this declaration relates, is (are) in conformity with the provisions of the above directives using the following principal standards.
auquel cette directive s'applique, est conforme aux dispositions des directives ci-dessus en utilisant les principales normes suivantes.
waarop deze verklaring betrekking heeft, conform is met de bepalingen in de bovenstaande richtlijnen door toepassing van de volgende normen.
auf das/die sich diese Erklärung bezieht, den Bestimmungen der obigen Richtlinien gemäß folgenden Normen entsprechen.

ENISO9001, ENISO12100

Issued at Hindley Green on 01/01/2006 by H.Seddon, Quality Assurance Manager.
Emis à Hindley Green le 01/01/2006 par H. Seddon, Directeur de l'Assurance Qualité.
Uitgegeven in Hindley Green op 01/01/2006 door H. Seddon, manager Kwaliteitsgarantie.
Ausgestellt in Hindley Green am 01.01.2006 von H. Seddon, Leiter Qualitätssicherung.

H. SEDDON

EC Pressure Equipment Directive and Related Regulations

We declare that this product has been assessed according to the Pressure Equipment Directive (97/23/EC) and, in accordance with the terms of this Directive, has been excluded from the scope of this Directive.

It may carry "CE" marking in compliance with other applicable EC Directives.

Directive de matériel de pression CE et tous rêglements s'en rapportant.

Nous déclarons que ce produit a été évalué selon la directive de matériel de pression (97/23/EC) et, conformément avec les termes de cette directive, il a été exclu de l'étendue de cette directive.

Il peut porter la marque CE" conformement avec les autres directives CE applicables.

EC Drukapparatuur Richtlijn en bijbehorende voorschriften

Wij verklaren hierbij dat dit product geëvalueerd werd conform de Drukapparaat Richtlijn (97/23/EC) en dat, in overeenstemming met de voorwaarden van deze richtlijn, deze hierop niet van toepassing zijn.

Het kan voorzien zijn van het CE" kuermerk overeenkomstig andere van toepassing zijnde EC richtlijnen.

EG-Richtlinie für Druckgeräte und anverwandte Vorschriften

Wir erklären hiermit, dass das Produkt gemäß der EG-Richtlinie für Druckgeräte (97/23/EC) geprüft wurde und laut den Bestimmungen dieser Richtlinie aus deren Geltungsbereich ausgeschlossen wurde.

Das Produkt darf laut anderer anwendbarer EG-Richtlinien mit der CE-Kennzeichnung versehen werden.

Os modelos de máquinas representados neste manual podem ser utilizados em diferentes locais do mundo. No caso de máquinas vendidas e expedidas para Territórios da União Europeia, é necessária a apresentação da Marca CE e a conformidade com os requisitos de várias directivas. Em tais casos, as especificações das máquinas foram submetidas a certificação da conformidade com as directivas CE. É absolutamente proibida toda e qualquer modificação de componentes ou partes, dado que invalidaria a certificação e a marcação CE. Segue-se uma declaração dessa conformidade:

I modelli descritti nel presente manuale possono riferirsi a macchine in uso in vari paesi del mondo. Le unità vendute e distribuite nei paesi dell'Unione Europea devono riportare il marchio CE ed essere conformi a numerose direttive. In questo caso, i dati di progetto devono specificare che l'unità è conforme alle Direttive CEE. Tutte le modifiche non autorizzate rendono nulla la certificazione e la validità del marchio CE. Di seguito, è riportata la Dichiarazione di conformità del produttore:

Los modelos de máquinas presentadas en este manual puede utilizarse en varias ubicaciones en todo el mundo. Las máquinas vendidas y enviadas a la Unión Europea requieren que la distinción de la Marca CE y la conformidad con diversas directrices comunitarias. En tales casos, las especificaciones de diseño de esta máquina han sido certificadas en su cumplimiento con las directrices de la CE. Cualquier modificación de las piezas está absolutamente prohibida y resultará en la invalidación del Certificado CE y la marca correspondiente. A continuación puede ver una declaración de conformidad:

Maskinmodellerne der vises i denne manual kan være nogen som bruges andre steder i verden. Maskiner der sælges og leveres til EU-medlemslande skal være forsynet med EC-mærket og overholde forskellige direktiver. I disse tilfælde er maskinens konstruktionsspecifikationer blevet certificeret, så de overholder EC-direktiverne. Enhver ændring, af nogen som helst del, er strengt forbudt, og vil medføre at CE-certificeringen og mærkningen bliver betragtet som ugyldig. Overensstemmelseserklæringen er som følger:

CE

DECLARAÇÃO DE CONFORMIDADE COM AS DIRECTIVAS CE
DICHIARAZIONE DI CONFORMITÀ CON LE SEGUENTI DIRETTIVE CEE:
DECLARACIÓN DE CONFORMIDAD CE CON DIRECTRICES DE LA CE
ERKLÆRING OM OVERENSSTEMMELSE MED EU-DIREKTIVER

97/23/EC, 98/37/EC

Esta Companhia, / Il Produttore, / nosotros, / vi,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

declara, sob sua única e exclusiva responsabilidade pelo fabrico e distribuição, que o(s) produto(s)
dichiara sotto la propria responsabilità, in qualità di produttore e fornitore, che il prodotto:
declaramos que, bajo nuestra responsabilidad de fabricación y suministro del/de los producto(s)
erklærer, udelukkende med ansvar for fremstilling og levering, at produktet/produkterne

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a que a presente declaração se refere, está (estão) em conformidade com o disposto nas directivas supramencionadas, de acordo com as principais normas, a seguir indicadas.
al quale si riferisce la presente dichiarazione, è conforme alle disposizioni delle Direttive citate e alle seguenti normative:
a los cuales se refiere esta declaración está(n) en conformidad con las provisiones de las directrices anteriormente mencionadas usando las siguientes normas principales.
som dette direktiv vedrører, er i overensstemmelse med bestemmelserne i ovennævnte direktiver i henhold til følgende overordnede standarder.

ENISO9001, ENISO12100

Emitida em Hindley Green a 01/01/2006 por H. Seddon, Director de Garantia de Qualidade.
Dichiarazione rilasciata a Hindley Green in data 01/01/2006 da H. Seddon, Responsabile della qualità aziendale.
Editado en Hindley Green el 01/01/2006 por H. Seddon, Director de Garantía de Calidad.
Udfærdiget i Hindley Green den 01-01-2006 af H. Seddon, kvalitetssikringschef.

H. SEDDON

Directiva de Equipamento de Pressão EC e Regulamentações relacionada.

Declaramos que este produto foi avaliado de acordo com a Directiva de Equipamento de Pressão (97/23/EC) e que de acordo com os termos desta, não está por ela abrangido.

Pode levar a marca "CE" em cumprimento com outras Directivas EC aplicáveis

Direttiva e Relative Regolamenti CE sulle Attrezzature a Pressione

Noi dichiariamo che questo prodotto è stato valutato in conformità alla Direttiva e CE sulle Attrezzature a Pressione (97/23/CE) e, in conformità coi termini di tale Direttiva, è stato escluso dallo scopo di detta Direttiva.

Potrebbe portare il marchio CE" in conformità con altre Direttive applicabili

Directiva de la CE sobre los Equipos de Presión y Reglamentaciones afines

Declaramos que este producto ha sido evaluado conforme a la Directiva de los Equipos de Presión (97/23/CE) y, de conformidad con los términos de esta Directiva, ha sido excluido del ámbito de esta Directiva.

Puede llevar la marca CE" en cumplimiento de otras Directivas aplicables de la CE.

ECF Trykudstyrsdirektiv og tilhørende regulativer

Vi erklærer, at dette produkt er blevet bedømt i overensstemmelse med Trykudstyrsdirektivet (97/23/EF) og i overensstemmelse med direktivets bestemmelser er fundet værende uden for dette direktivs område.

Det kan være "CE"-mærket i henhold til andre relevante EF-direktiver.

Maskinmodeller som beskrivs i denna manual kan användas på olika platser i världen. För maskiner som säljs eller fraktas till länder inom Europeiska Unionen krävs att maskinen har EC-märkning och att den uppfyller olika direktiv. I sådana fall har designspecifikationen för denna maskin bekräftats överensstämma med EC-direktiv. Varje modifiering av delar är absolut förbjuden och skulle resultera i att CE-certifieringen och märkningen blir ogiltiga. En deklaration av denna överensstämmelse följer:

Maskinmodeller som er representert i denne brukerhåndboken kan brukes på forskjellige steder i hele verden. Maskiner solgt og sendt til EU krever at maskinen påføres EC-merket og retter seg etter flere forskjellige direktiver. I slike tilfeller er designspesifiksjonene til denne maskinen blitt sertifisert i overenstemmelse med EU-direktivene. Envher modifikasjon til noen av delene er absolutt forbudt, og vil føre til at CE-sertifiseringen og merkingen blir erklært ugyldig. En deklarering av denne overenstemmelse følger:

Tässä ohjeessa kuvattuja konemalleja voidaan käyttää eri paikoissa kaikkialla maailmassa. Euroopan unionin alueella myytävissä koneissa on oltava EC-merkintä, ja niiden on oltava tiettyjen direktiivien mukaisia. Tällaisissa tapauksissa koneen rakennespesifikaatiot on sertifioitu EU-direktiivien mukaisiksi. Minkä tahansa osan muuttaminen on ehdottomasti kielletty. Jonkin osan muuttaminen muuttaa CE-sertifikaatin ja merkinnän kelpaamattomaksi. Alla on vakuutus yhdenmukaisuudesta:

Τα μοντέλα μηχανημάτων που παρουσιάζονται στο παρόν εγχειρίδιο ενδέχεται να χρησιμοποιούνται σε διάφορες τοποθεσίες παγκοσμίως. Για την πώληση και την αποστολή μηχανημάτων στις περιοχές της Ευρωπαϊκής Ένωσης απαιτείται το μηχάνημα να φέρει τη σήμανση ΕΟ και να είναι σύμφωνο με διάφορες οδηγίες. Σε τέτοιου είδους περιπτώσεις, οι προδιαγραφές σχεδιασμού του μηχανήματος αυτού έχουν πιστοποιηθεί ότι είναι σύμφωνες προς τις οδηγίες της ΕΚ. Τυχόν τροποποίηση σε οποιοδήποτε τμήμα απαγορεύεται απολύτως και θα είχε ως αποτέλεσμα την ακύρωση της πιστοποίησης και της σήμανσης CE. Ακολουθεί μια δήλωση της συμμόρφωσης αυτής:

CE

EC DEKLARATION OM ÖVERENSSTÄMMELSE MED EC DIREKTIV
EU-deklarasjon som viser overensstemmelse med EU-direktiver
VAKUUTUS EU-VAATIMUSTEN TÄYTTÄMISESTÄ
ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΠΡΟΣ ΤΙΣ ΟΔΗΓΙΕΣ ΤΗΣ ΕΚ

97/23/EC, 98/37/EC

vi, / vi, / Me, / Η εταιρεία μας,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

deklarerar att, under vårt ansvar för tillverkning och leverans,
produkten, eller produkterna
deklarerer at, under vårt eneansvar for produksjon og levering,
er produktet/produktene
vakuutamme yksinomaisella vastuullamme, että tuote/tuotteet
δηλώνει ότι, με αποκλειστική μας ευθύνη για την κατασκευή και την προμήθεια,
ôï(á) ðñïúüí(ôá)

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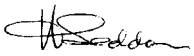
som dessa direktiv relaterar till, är i överensstämmelse med kraven enligt ovanstående direktiv med användning av följande huvudstandarder.
som dette direktivet gjelder, i overensstemmelse med forskriftene til direktivet nevnt ovenfor ved å bruke følgende prinsipielle standarder.
jo(i)ta tämä lausunto koskee, on/ovat yllä olevien direktiivien mukaisia ja noudattavat seuraavassa mainittuja pääasiallisia standardeja.
στο(α) οποίο(α) αναφέρεται η παρούσα οδηγία, είναι σε συμφωνία με τους όρους των ανωτέρω οδηγιών με χρήση των ακόλουθων κύριων προτύπων.

ENISO9001, ENISO12100

Utgiven i Hindley Green 2006-01-01 av H. Seddon, QA-manager.
Utgitt ved Hindley Green, 01.01.2006 av H. Seddon, kvalitetssikringsleder.
Myönnetty Hindley Greenissä 1.1.2006, myöntäjä laatupäällikkö H. Seddon.
Εκδόθηκε στο Hindley Green στις 01/01/2006 από τον H. Seddon, Διευθυντή διασφάλισης ποιότητας.



H. SEDDON

EG tryckutrustningsdirektiv och tillhörande förordningar

Undertecknade betygar härmed att denna produkt har bedömts i enlighet med tryckutrustningsdirektivet (97/23/EG) och har i enlighet med villkoren i detta direktiv undantagits från direktivets omfattning.

Den får bära CE-märke i överensstämmelse med andra lämpliga EG-direktiv.

EC Pressure Equipment Directive (trykkutstyrsdirektivet) og tilhørende bestemmelser

Vi erklærer at dette produktet er blitt vurdert ifølge Pressure Equipment Directive (97/23/EC), og ifølge same er blitt unntatt fra direktivets bestemmelser.

Det kan være CE"-merket i samsvar med andre, aktuelle EC direktiver.

EY:n painelaitedirektiivi ja siihen liittyvät määräykset

Vakuutamme, että tämä tuote on arvioitu painelaitedirektiivin (97/23/EY) mukaisesti ja että sen on sanotun direktiivin ehtojen nojalla katsottu jäävän kyseisen direktiivin sovellusalueen ulkopuolelle.

Tuote voi muiden sitä koskevien EY-direktiivien mukaisesti olla varustettu "CE"-merkinnällä.

Οδηγία περί Εξοπλισμού Πιέσεως και σχετικοί Κανονισμοί της ΕΕ

Δια του παρόντος δηλώνουμε ότι το προϊόν αυτό έχει αξιολογηθεί σύμφωνα με την Οδηγία περί Εξοπλισμού Πιέσεως (97/23/ΕΕ) και σύμφωνα με τους της εν λόγω Οδηγάς, έχει εξαιρεθεί από τον σκοπό της εν λόγω Οδηγίας..

Μπορεί να φέρει το σημάδι “CE” σύμφωνα με άλλες ισχύουσες Οδηγίες της ΕΕ

:Juhendis kirjeldatud masinaid võidakse kasutada mitmel pool maailmas. Euroopa Liidu riikidesse tarnitavatel masinatel peab olema EC tunnus ning need masinad peavad vastama mitmetele direktiividele. Vastavatel juhtudel on masina konstruktsioonile väljastatud EL direktiividele vastavuse sertifikaat. Masina ja selle osade ehituse igasugune muutmine on keelatud ning põhjustab CE sertifikaadi ja tunnuse kehtivuse lõppemise. Järgnevalt on toodud vastavusdeklaratsioon:

Ðajâ rokasgrâmatâ minçtâs iekârtas var tikt ekspluatçtas daþâdâs pasaules vietâs. Eiropas Savienîbas teritorijâ tirgotajâm un piegâdâtajâm iekârtâm jâbût maríçtâm ar EK maríçjumu un jâatbilst vairâkâm direktîvâm. Ðajos gadîjumos tiek sniegts arî apliecinâjums par iekârtu projektçðanas tehnisko normu atbilstîbu EK direktîvâm. Jebkâda iekârtu elementu modificçðana ir kategoriski aizliegta un var novest pie CE sertifikâcijas un maríçjuma atzîðanas par nederîgu. Tâlâk ir pieejama minçtâs atbilstîbas deklarâcija:

Ðiame vadove pateikti aparato modeliai gali bûti naudojami ávairiose pasaulio vietose. Aparatai, kurie parduodami ir siunèiami Europos Sàjungos Teritorijose, privalo turëti EB þymà ir atitikti ávairias direktyvas. Tokiais atvejais, ðio aparato konstrukcijos specifikacijos yra patvirtintos, kaip atitinkanèios EB direktyvas. Bet kurios dalies bet koks pakeitimas yra visiðkai uþdraustas ir padarys CE Sertifikavimà ir þymëjimà negaliojanèiais. Toliau pateikiama ðios atitikties deklaracija:

Wymienione w niniejszej instrukcji modele maszyn mogą być stosowane na całym świecie. Maszyny sprzedawane i dostarczane na terytorium Unii Europejskiej wymagają umieszczenia znaku „CE” oraz zgodności z różnymi dyrektywami. Specyfikacje tego urządzenia zostały uznane za spełniające wymogi dyrektyw WE. Modyfikacje jakichkolwiek części są absolutnie zabronione i powodują unieważnienie świadectwa zgodności z dyrektywami WE i znaku „CE”. Poniżej zamieszczono odnośną deklarację zgodności:

CE

EL DEKLARATSIOON VASTAVUSE KOHTA JÄRGMISTELE EL DIREKTIIVIDELE:
EK DEKLARÂCIJA PAR ATBILSTÎBU EK DIREKTÎVÂM
EB ATITIKTIES EB DIREKTYVOMS DEKLARACIJA
DEKLARACJA WE ZGODNOŚCI Z DYREKTYWAMI WE

97/23/EC, 98/37/EC

meie, / Mçs, / mes, / My,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

deklareerime täieliku vastutuse juures, et valmistatud ja tarnitud toode/tooted
ar pilnu atbildîbu par izgatavoðanu un piegâdi apliecinâm, ka izstrâdâjums (-i)
visiðkai atsakydami uþ gamybà ir tiekimà, deklaruojame, kad gaminys (-iai)
oświadczamy, ponosząc wyłączną odpowiedzialność za wyprodukowanie i dostawę, że produkt(y)

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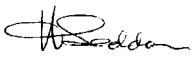
mille kohta see deklaratsioon kehtib, on vastavuses loetletud direktiivide nõuetega järgmiste standardite põhimõtete kohaselt.
uz kuru (-iem) attiecas ðî deklarâcija, atbilst augðminçto direktîvu prasîbâm, kas izriet no tâlâk minçtajiem pamatstandartiem
kuriam (-iems) taikoma ði direktyva, atitinka aukðèiau nurodytø direktyvø nuostatas, taikant ðiuos pagrindinius standartus.
do którego (których) niniejsza dyrektywa ma zastosowanie, jest (są) zgodny(e) z postanowieniami w/w dyrektyw, a do którego (których) użyto następujących zasadniczych norm:

ENISO9001, ENISO12100

Välja antud Hindley Greenis, 1. 1. 2006. a kvaliteedikontrolöri H. Seddoni poolt.
Izdevis H. Seddon, kvalitâtes nodroðinâðanas nodaïas vadîtâjs; Hindley Green, 01.01.2006.
Paskelbë H. Seddon, kokybës uþtikrinimo direktorius, Hindley Green, 2006-01-01
Wydano w Hindley Green dnia 01.01.2006 przez H. Seddon, Menedżera ds. Zapewniania Jakości.



H. SEDDON

EÜ surveseadmete direktiiv ja seostuvad normatiivaktid

Kinnitame, et käesolev toode on Surveseadmete direktiivi (97/23/EÜ) alusel üle vaadatud ning, tuginedes direktiivis sätestatule, on tunnistatud selle direktiivi ulatusest väljaspool olevaks.

Seade võib “CE” märki kanda vastavalt muudele kohaldatavatele EÜ direktiividele.

EK direktîva par spiedieniekârtâm un saistîti noteikumi

Mçs paziòojam, ka ðis produkts ir novçrtçts atbilstoði Eiropas Savienîbas direktîvai 97/23/EC par spiedieniekârtâm un saskaòâ ar ðîs direktîvas nosacîjumiem ir no ðîs direktîvas izslçgts.

Tam var bût pievienots maríçjums "CE" atbilstoði citâm piemçrojamâm ES direktîvâm.

EB oro spaudimo árangos direktyvos ir susijusios taisyklës

Patvirtiname, kad ðis produktas buvo ávertintas pagal Oro spaudimo árangos direktyvà (97/23/EC) ir pagal ðios direktyvos sàlygas nebuvo átrauktas á ðià direktyvà.

Jis gali bûti þymimas „CE“ atsiþvelgiant á kitas EB taikomas direktyvas.

Dyrektywa WE dotycząca urządzeń ciśnieniowych i przepisy pokrewne

Firma deklaruje, że to urządzenie zostało sprawdzone zgodnie z Dyrektywą dotyczącą urządzeń ciśnieniowych (97/23/WE) i zgodnie z jej postanowieniami, nie zostało objęte tą dyrektywą.

Na urządzeniu może znajdować się oznaczenie „CE”, zgodnie z innymi dyrektywami WE.

Stroje, ktoré sú v tejto príruèke uvedené sa môžu používať v rôznych èastiach sveta. Od strojov, ktoré sa predávajú a dodávajú do krajín na území Európskej únie sa vyžaduje, aby bola na stroji zobrazená znaèka EC a aby vyhovoval rôznym smerniciam. V takýchto prípadoch je špecifikácia tohto stroja certifikovaná tak, aby spåòala smernice EÚ. Akákoµvek úprava akejkoµvek èasti stroja je úplne zakázaná a mohla by mať za následok, že Certifikácia a oznaèenie CE by sa stalo neplatným. Prehlásenie o takejto zhode je uvedené ïalej:

Modely strojù uvádìné v této pøíruèce mohou být používány na rùzných místech po celém svìtì. U strojù prodávaných a dodávaných do zemí Evropské unie je vyžadováno, aby by stroj opatøen certifikaèní znaèkou CE a aby splòoval rùzné smìrnice. V tìchto pøípadech byly konstrukèní specifikace tohoto stroje certifikovány ve shodì se smìrnicemi EU. Jakákoliv úprava kterékoliv souèásti je pøísnì zakázána a zpùsobila by neplatnost certifikace CE a certifikaèní znaèky. Následuje prohlášení o této shodì:

Modeli strojev, ki so opisani v tem priroèniku, so uporabni na razliènih lokacijah po vsem svetu. Stroji, ki so prodani in poslani na teritorij Evropske Unije morajo imeti na stroju oznako EC in morajo ustrezati razliènim direktivam. V takšnih primerih je specifikacija zasnove takega stroja potrjena kot skladna z direktivo EC. Kakršnakoli sprememba kateregakoli dela je absolutno prepovedana in vodi k neveljavnosti CE certifikata in oznake. Izjava o skladnosti sledi:

Jelen utasításban feltüntetett géptípusok különbözõ helyeken lehetnek használatban világszerte. Az Európai Unió területére szállított, illetve ott értékesített gépeknél a gépen fel kell tüntetni a CE jelölést és azoknak különbözõ irányelveknek kell megfelelniük. Ilyen esetben a gép tervezési adatai igazoltan megfelelnek az Európai Közösség irányelveinek. Bármilyen alkatrész bárminemû módosítása kifejezetten tilos és ez a CE minõsítés, valamint jelölés érvényességének elvesztését eredményezi. Következik az ide vágó megfelelõségi nyilatkozat:

CE

PREHLÁSENIE O ZHODE SO SMERNICAMI EÚ
PROHLÁŠENÍ O SHODÌ SE SMÌRNICEMI EU
EC IZJAVA O SKLADNOSTI Z DIREKTIVAMI EC
EURÓPAI KÖZÖSSÉG MEGFELELÕSÉGI NYILATKOZATA A KÖVETKEZÕ EGK IRÁNYELVEKKEL KAPCSOLATOSAN

97/23/EC, 98/37/EC

my, / My, / Mi, / Alulírottak,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

prehlasujeme na našu výhradnú zodpovednosť za výrobu a dodávku, že výrobok (výrobky)
na svou plnou odpovìdnost za výrobu a dodávku prohlašujeme, že výrobek
izjavljamo, da je (so) pod našo izkljuèno odgovornostjo za proizvodnjo in dobavo proizvod(i)
felelõsségünk teljes tudatában kijelentjük, hogy az irányelvek által érintett termék(ek), az

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ku ktorému sa táto smernica vzťahuje je (sú) v súlade s ustanoveniami horeuvedených smerníc a že dodržiava nasledovné základné normy.
na který se vztahují tyto smìrnice, je ve shodì s ustanoveními výše uvedených smìrnic podle následujících hlavních norem:
na katere se nanaša ta direktiva, je (so) skladni z doloèbami zgornjih direktiv ob uporabi naslednjih glavnih standardov.
és annak gyártása, valamint szállítása a következõ mérvadó szabványok alkalmazásával teljes mértékben megfelel a következõ irányelvek elõírásainak:

ENISO9001, ENISO12100

Vydané v Hindley Green, dòa 1. 1. 2006 H Seddonom, manažérom pre zabezpeèenie kvality.
Vydáno v Hindley Green dne 1. 1. 2006, H. Seddon, manažér zabezpeèování jakosti.
Izdal H. Seddon, vodja oddelka za zagotavljanje kakovosti, Hindley Green, 1/ 01/ 2006.
Kiadta H. Seddon, minõségbiztosítási menedzser Hindley Greenben, 01/01/2006.

H. SEDDON

EC smernica a doplòujúce predpisy pre tlakové zariadenia

Prehlasujeme, že tento výrobok bol posudzovaný v súlade so smernicou o tlakových zariadeniach (97/23/EC) a že, v súlade s touto smernicou, nespadá pod úèinnosť tejto smernice.

Môže byť oznaèený skratkou „CE“ v súlade s inými smernicami EC.

Smìrnice EC pro tlaková zaøízení a související pøedpisy

Prohlašujeme, že tento výrobek byl vyhodnocen podle smìrnice pro tlaková zaøízení (97/23/EC) a v souladu s podmínkami této smìrnice byl vyjmut z pùsobnosti této smìrnice.

Tento výrobek mùže nést oznaèení „CE“ v souladu s ostatními pøíslušnými smìrnicemi EC.

Direktiva ES o tlaèni opremi in sorodni predpisi

Izjavljamo, da je ta izdelek ocenjen po Direktivi ES o tlaèni opremi (97/23/EC) in je v skladu z njo izvzet iz obsega te Direktive.

V skladu z drugimi ustreznimi Direktivami ES lahko nosi oznako »CE«.

Az Európai Közösség túlnyomásos berendezésekre vonatkozó irányelvei és az azokhoz kapcsolódó szabályozások

Kijelentjük, hogy a termék a túlnyomásos rendszerekre vonatkozó irányelv (97/23/EC) szerinti bevizsgálása megtörtént. Az említett irányelvben foglaltak értelmében az eszköz nem tartozik az irányelv hatálya alá.

Az ide vonatkozó egyéb európai közösségi irányelvek értelmében az eszköz hordozhatja a „CE” jelet.

Il-mudelli tal-magni rrappre\entati f'dan il-manwal jistg]u jintu\aw f'diversi postijiet madwar id-dinja. Il-magni mibjug]a u mibg]uta fit-Territorji ta' l-Unjoni Ewropeja je]tie[u li l-magni juru l-marka ta' l-EU u li jkunu konformi mad-diversi direttivi. F'ka\ijiet b]al dawn, l-ispecifikazzjonijiet tad-disinn ta' din il-magna kienu ccertifikati li jikkonformu mad-direttivi ta' l-EC. Kull tibdil ta' xi parti huwa assolutament ipprojbit u jirri\ulta li c-Certifikazzjoni u l-marka tas-CE ma jibqg]ux validi. Din li [ejja hija dikjarazzjoni ta' konformit`:

CE

DIKJARAZZJONI TA' KONFORMITÁ TA' L-EC MAD-DIRETTIVI TA' L-EC

97/23/EC, 98/37/EC

a]na,

INGERSOLL-RAND COMPANY LIMITED
SWAN LANE
HINDLEY GREEN
WIGAN WN2 4EZ
UNITED KINGDOM

niddikjaraw li, ta]t ir-responsabbilt` tag]na biss g]all-manifattura u l-provvista, il-prodott/i

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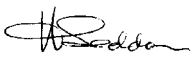
li g]alih/om din id-direttiva tapplika, hu (huma) konformi mal-provvedimenti tad-direttivi li jidhru hawn fuq bl-u\u ta' l-istandards principali li [ejjin.

ENISO9001, ENISO12100

Ma]ru[f'Hindley Green fl-01/01/2006 minn H. Seddon, Mani[er fuq l-A``ertament tal-Kwalità.



H. SEDDON

Direttiva KE dwar Tag]mir bi Pressjoni u Regolamenti Relatati

A]na niddikjaraw li dan il-prodott kien assessjat skond id-Direttiva dwar Tag]mir bi Pressjoni (97/23/KE) u, skond it-termini ta' din l-istess Direttiva, kien esklu\ mill-iskop tad-Direttiva.

Jista' j[orr il-marka "CE" b'konformità ma' Direttivi KE applikabbli o]rajn.

22699706

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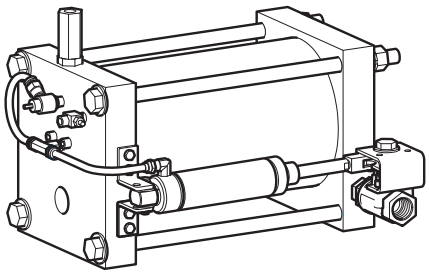

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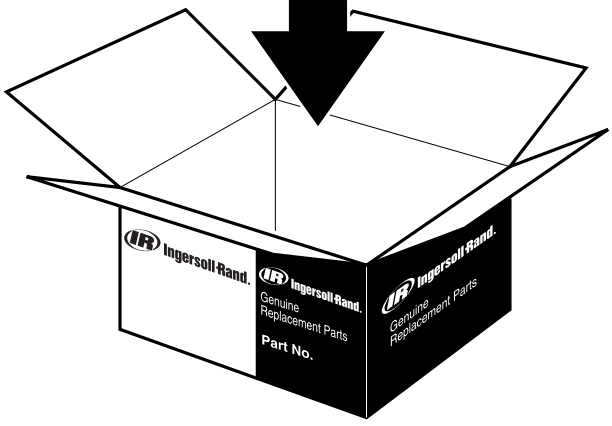

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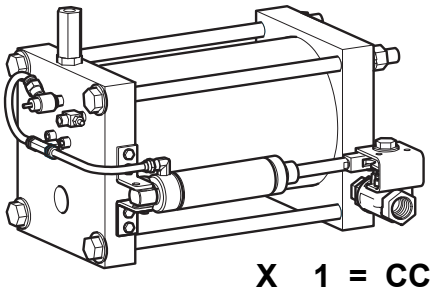

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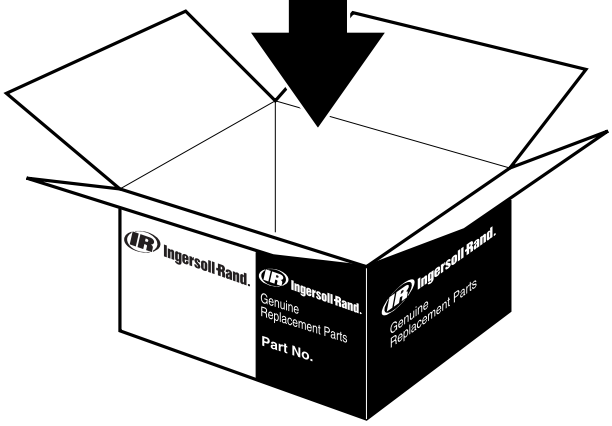

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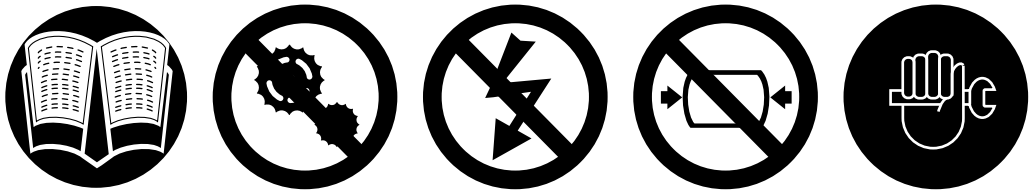

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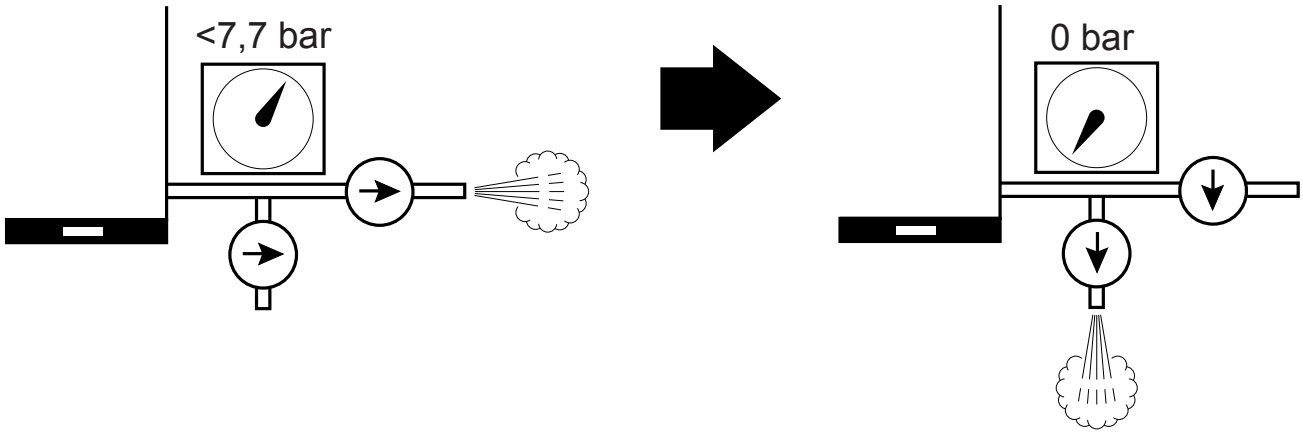

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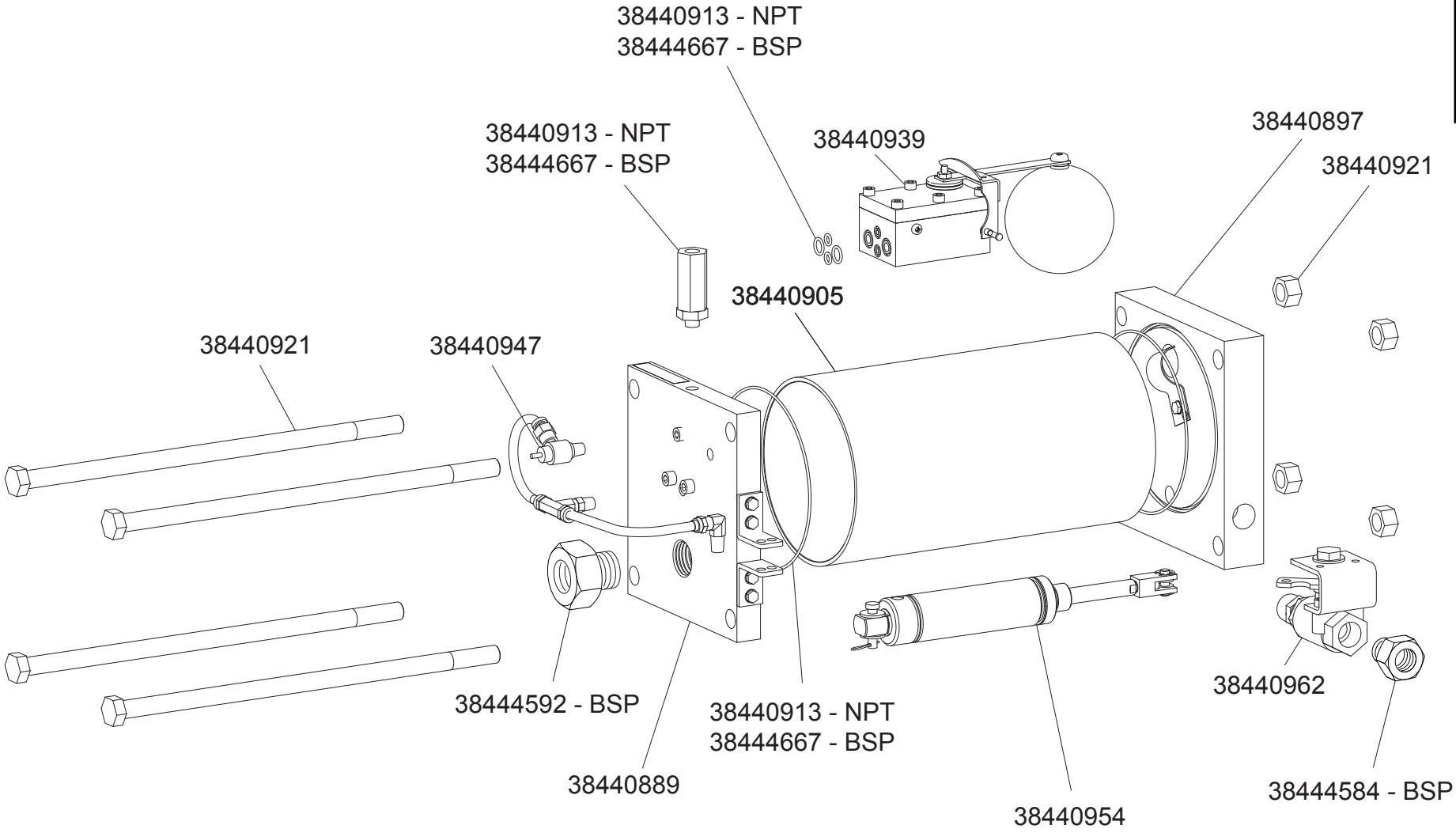

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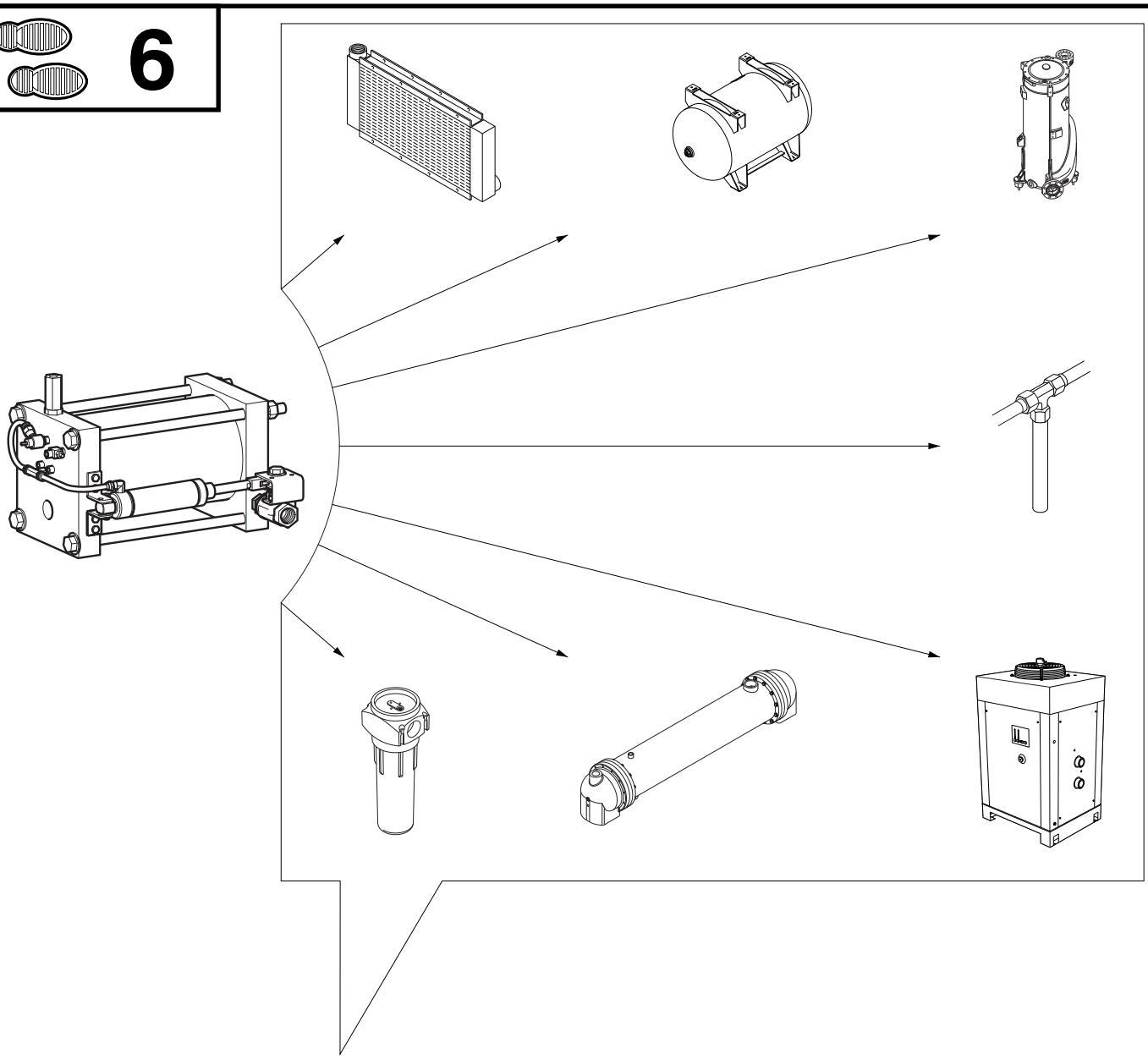

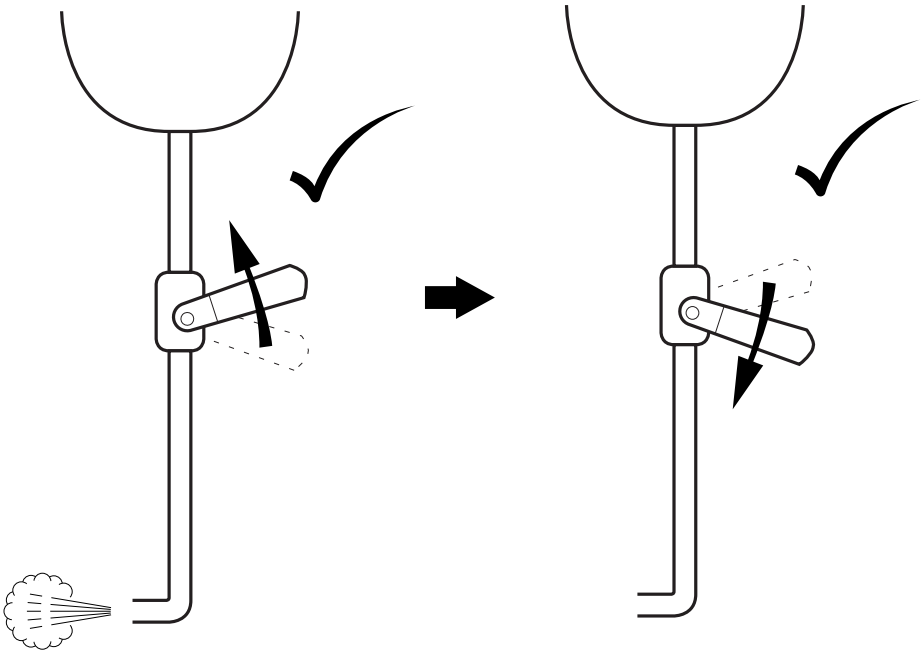

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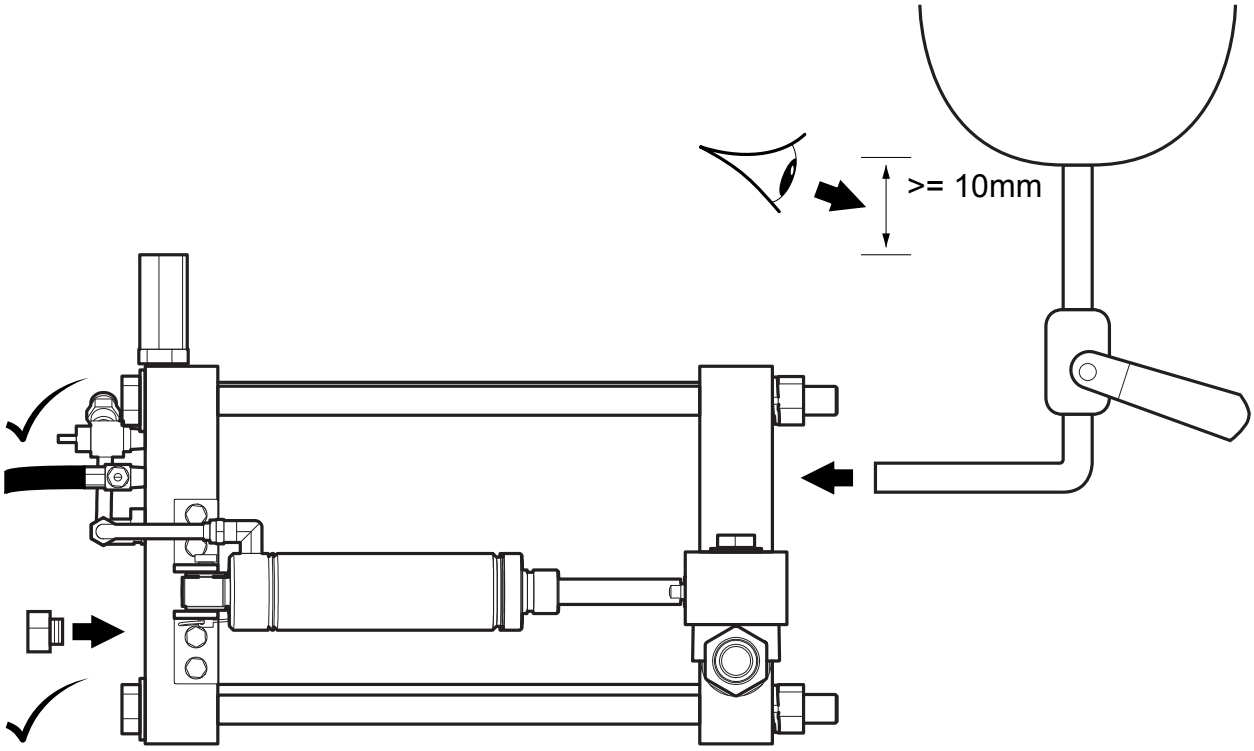

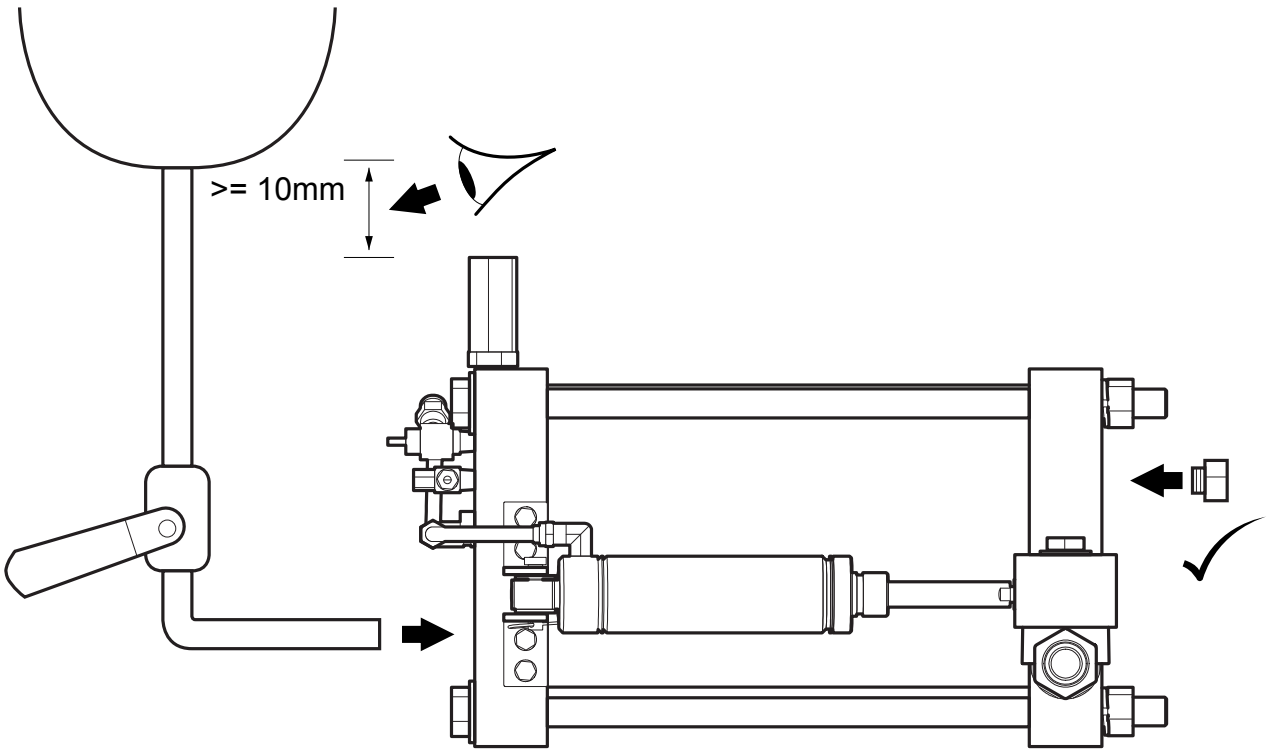

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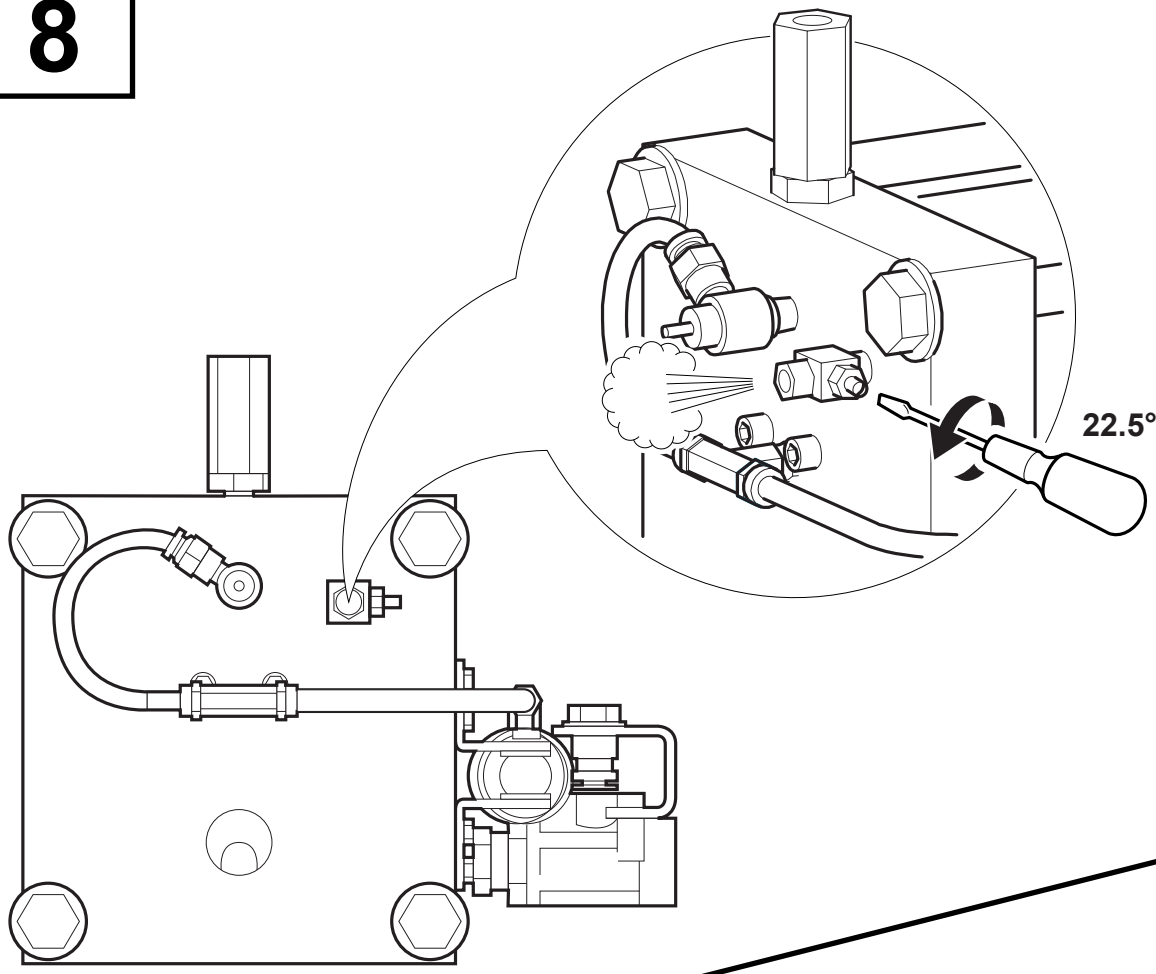

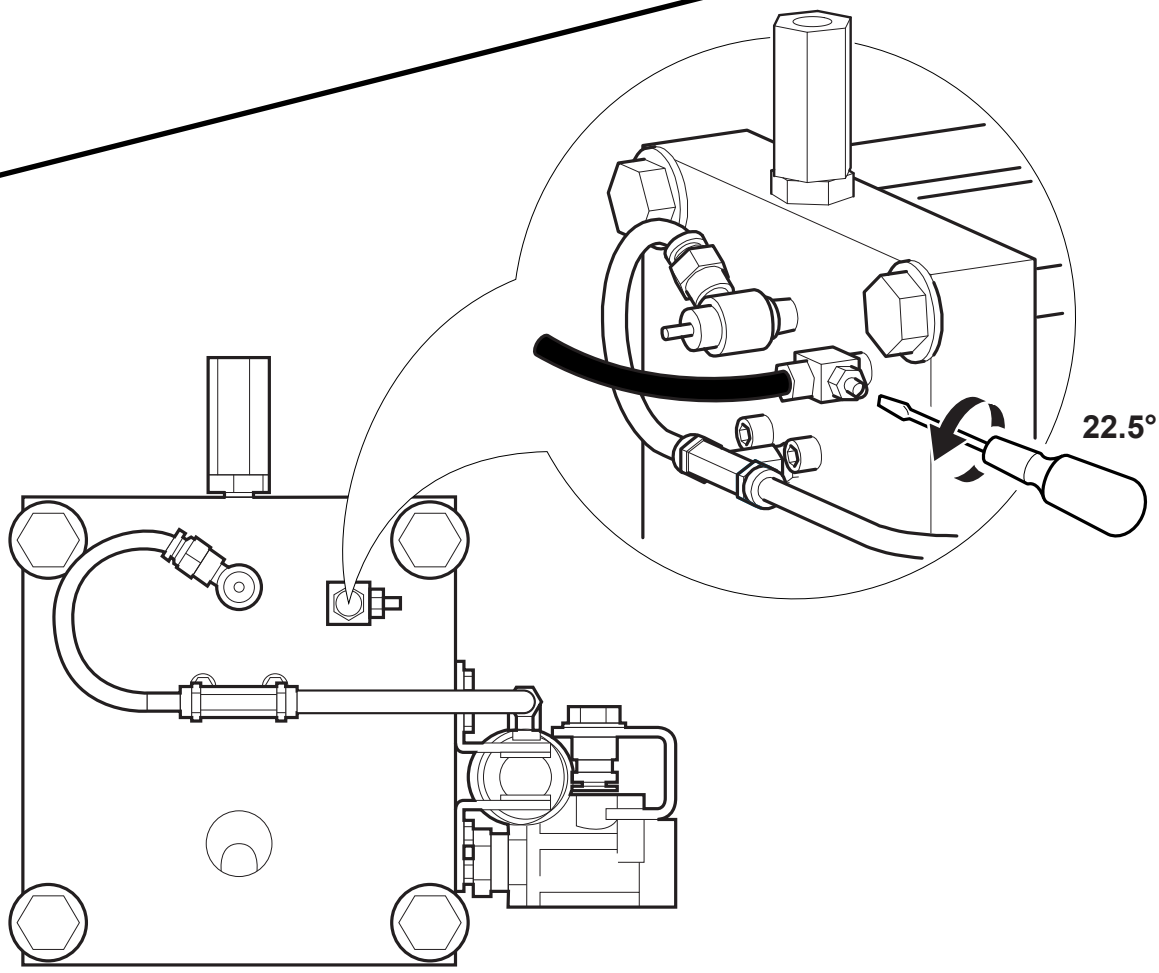

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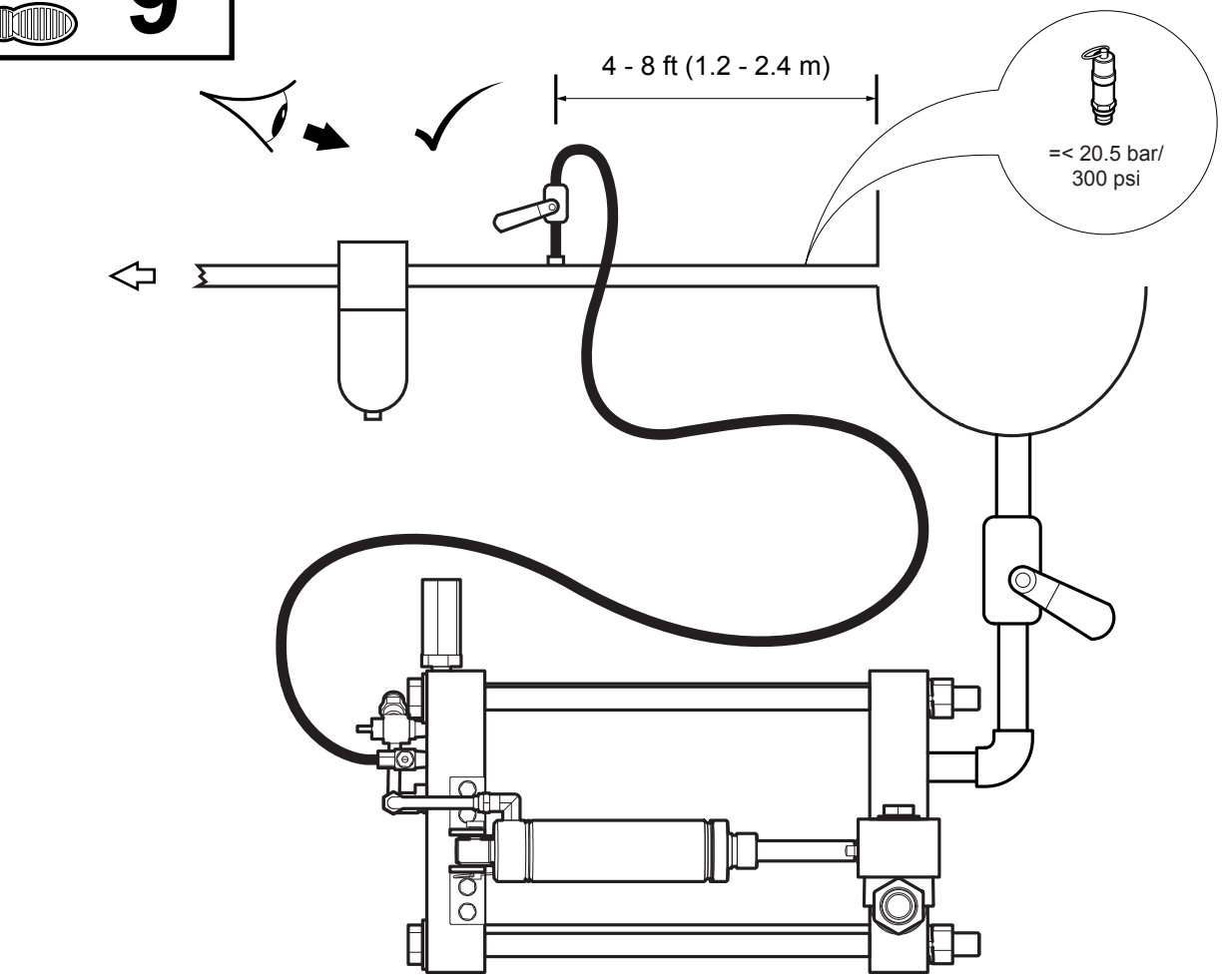

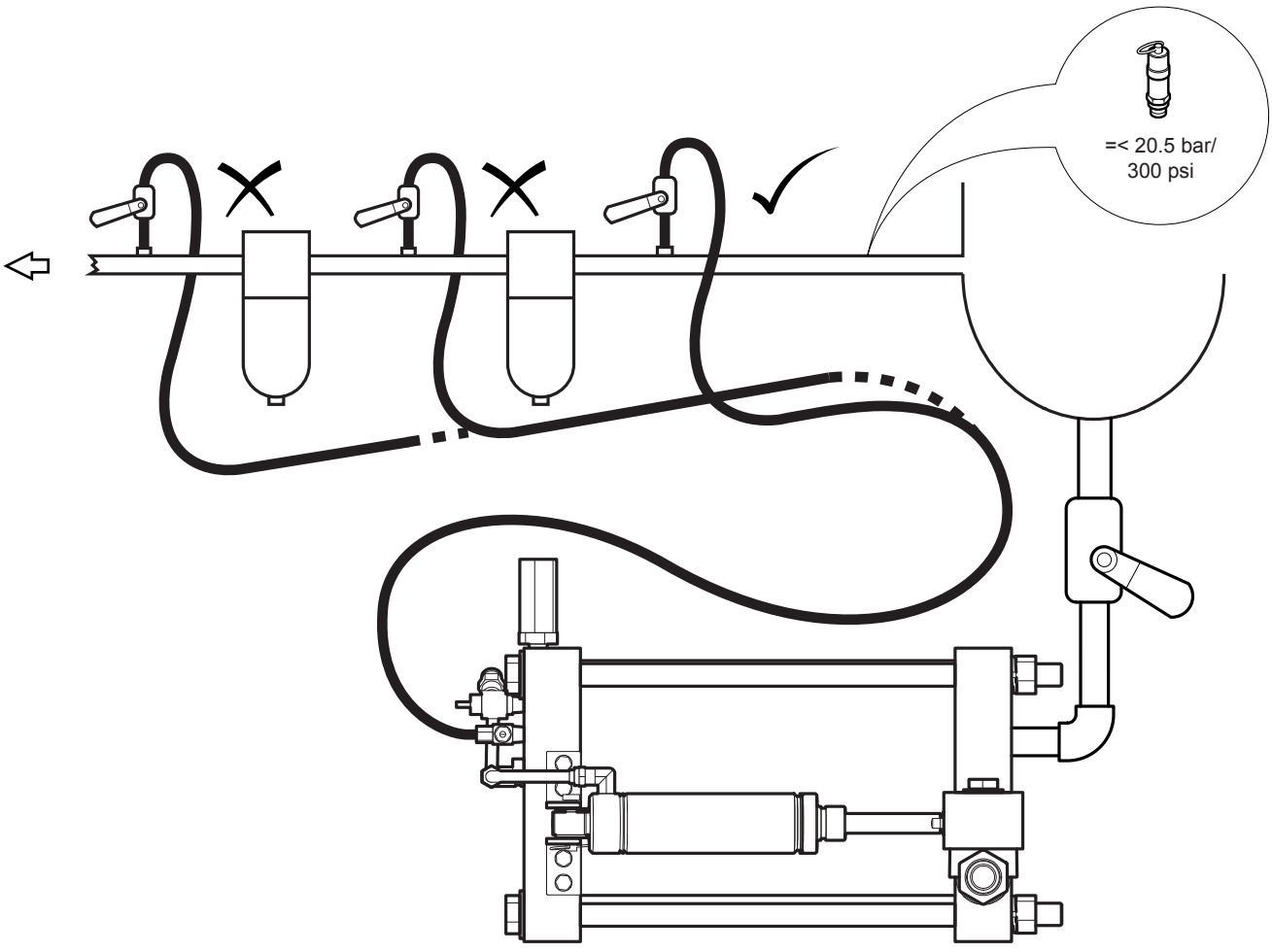

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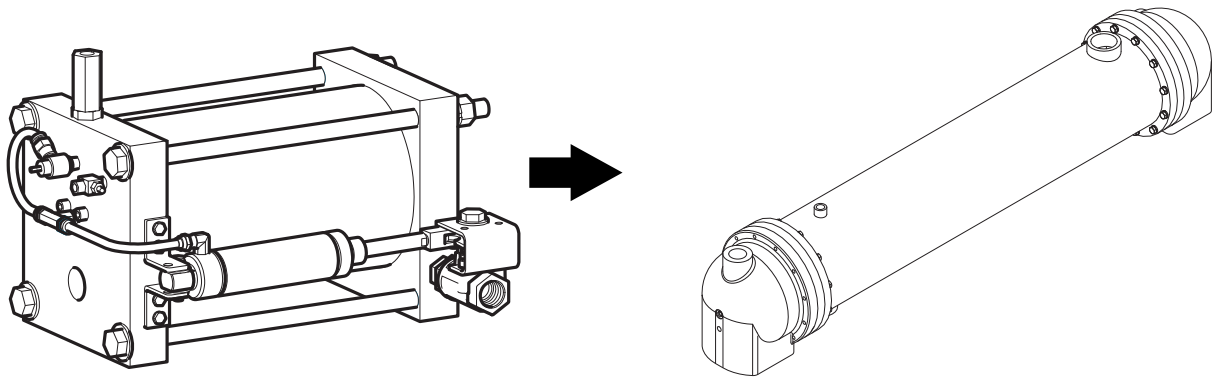

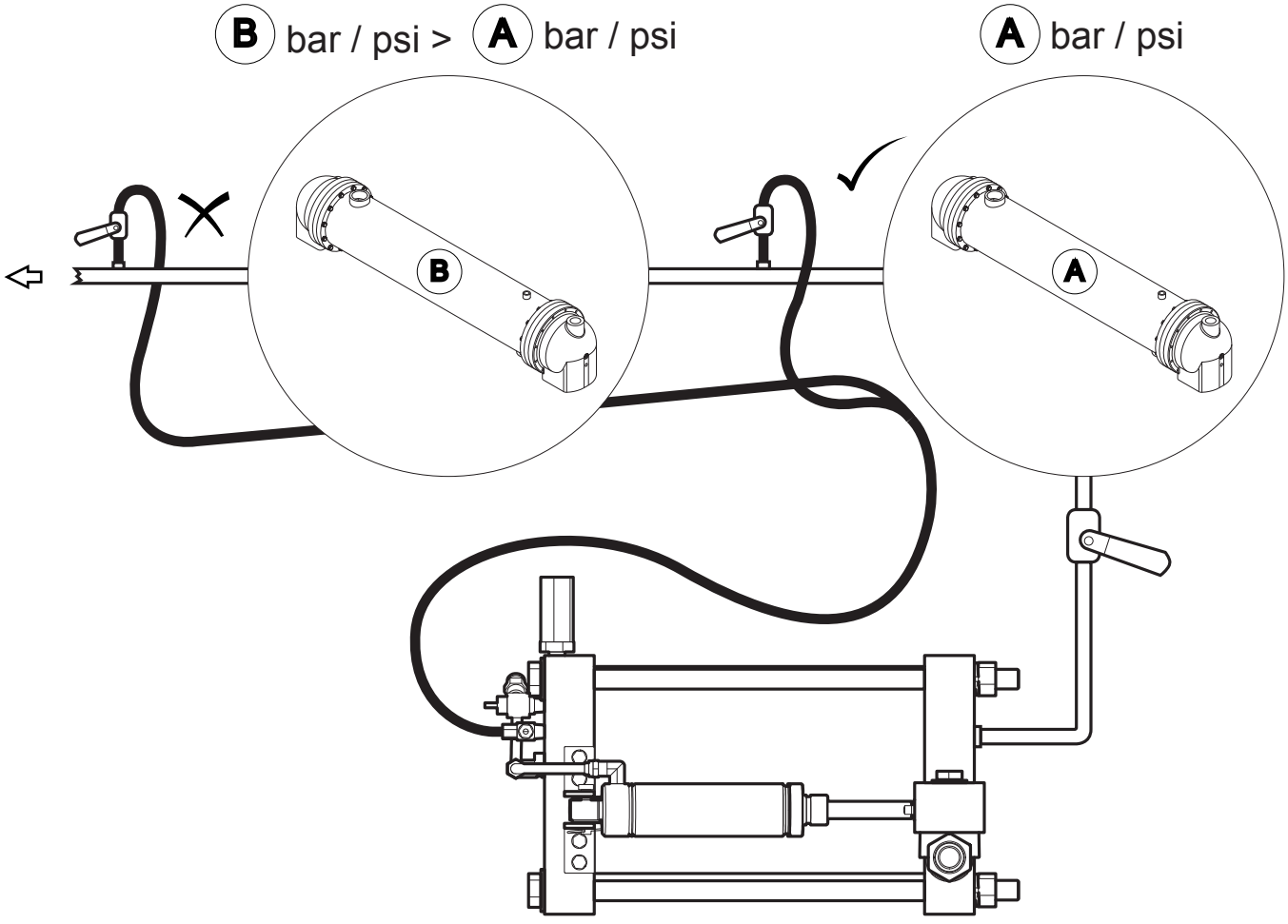

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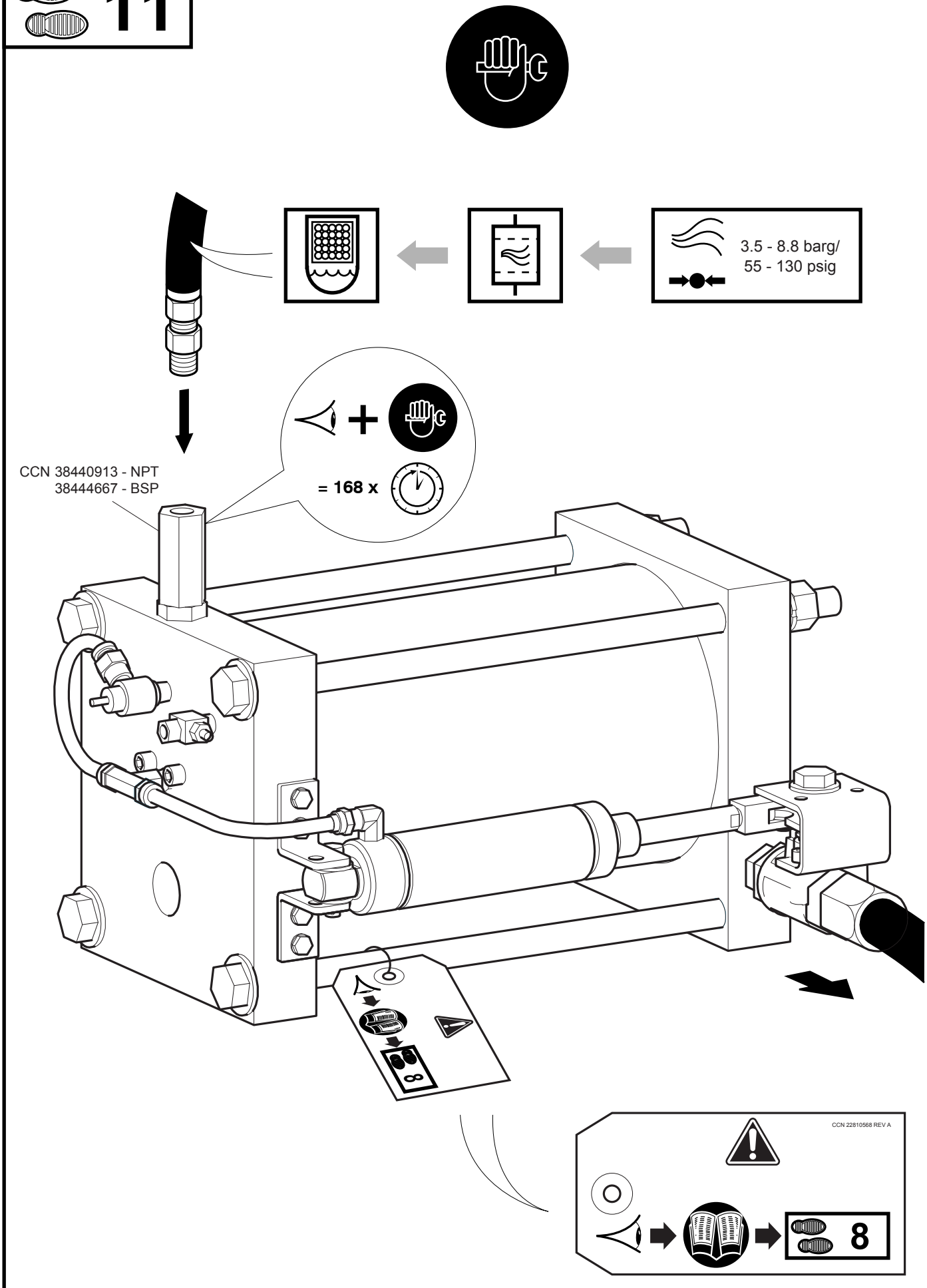
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55 - 130 psig
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38444667 - BSP
= 168 x
8
CCN 22810568 REV A
8

HVAC Submittal Cover Sheet

SECTION: 3
PRODUCT: Grilles, Registers, & Diffusers

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Nailor Industries
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: GRILLES, REGISTERS & DIFFUSERS PAGE: 1 OF 1

MANUFACTURER: NAILOR INDUSTRIES FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

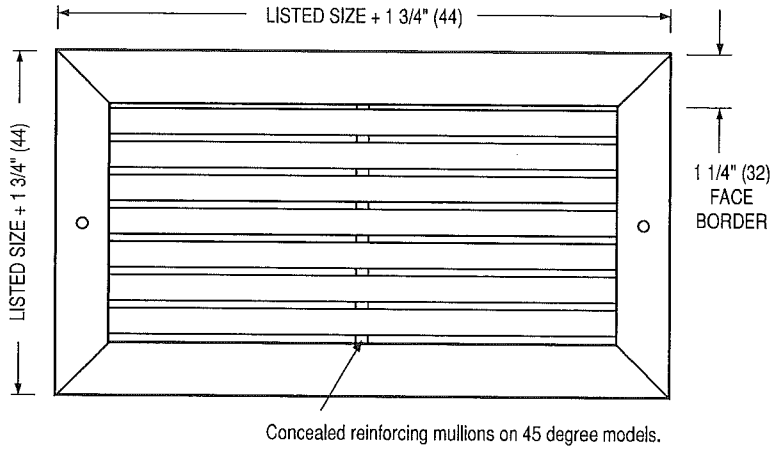
PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES
LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS
REMARKS: CUST: PAULSON-CHEEK MECHANICAL

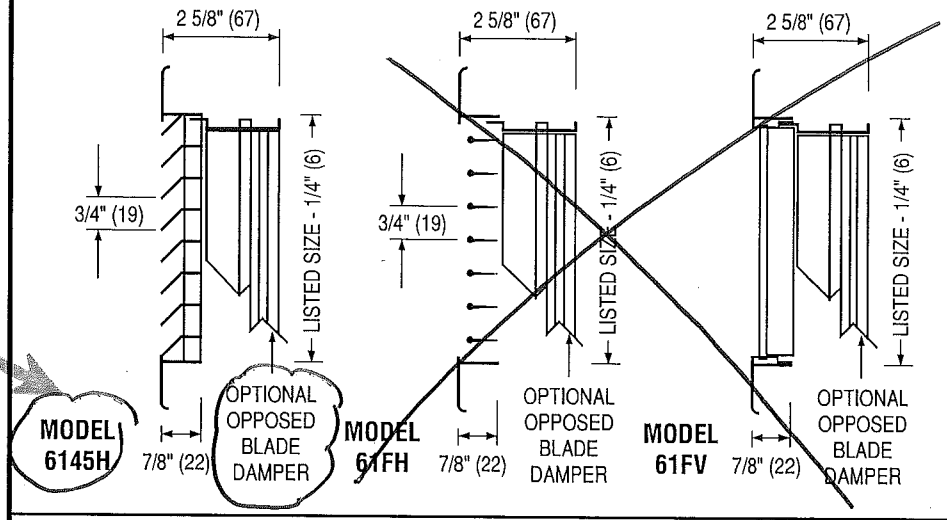
TAG	MODEL NO.	QTY	SIZE	FINISH	DWG. NO.	REMARKS
Exhaust Grilles	6145H-O*12x12*S*AW*A	2	12x12	AW White	6100-3	Surface Mount w/ OBD
Door Grilles	61DGD*12x12*AW	2	12x12	AW White	61DG-1	Double Flange Door Grilles

TAG: Exhaust Grilles

Nailor® Industries Inc.

STEEL RETURN GRILLES & REGISTERS
FIXED BLADES • 3/4" (19) SPACING
MODELS: 6145H(-O), 6145V(-O), 61FH(-O) AND 61FV(-O) TYPE S





- ☐ **MODEL 6145H**
  Single Deflection Grille
  Fixed 45° Horizontal Blades
- ☑ **MODEL 6145H-O**
  Single Deflection Register
  Fixed 45° Horizontal Blades
  (Includes O. B. Damper)
- ☐ **MODEL 6145V**
  Single Deflection Grille
  Fixed 45° Vertical Blades
- ☐ **MODEL 6145V-O**
  Single Deflection Register
  Fixed 45° Vertical Blades
  (Includes O. B. Damper)
- ☐ **MODEL 61FH**
  Single Deflection Grille
  Fixed 0° Horizontal Blades
- ☐ **MODEL 61FH-O**
  Single Deflection Register
  Fixed 0° Horizontal Blades
  (Includes O. B. Damper)
- ☐ **MODEL 61FV**
  Single Deflection Grille
  Fixed 0° Vertical Blades
- ☐ **MODEL 61FV-O**
  Single Deflection Register
  Fixed 0° Vertical Blades
  (Includes O. B. Damper)

DESCRIPTION:

1. Construction: Corrosion-resistant steel. Roll-formed frame mechanically interlocked with reinforced mitered corners for strength. Roll-formed blades on 3/4" (19) centers are fixed at 0 or 45 degrees to match and compliment the supply grilles and registers. 45 degree model utilizes a concealed rear reinforcing mullion (max. 16" (406) centers) and a single blade pack that provides a continuous louvered appearance. 0 degree models utilize a visible face mullion when blade length exceeds 16" (406).
2. Optional roll-formed steel opposed blade damper has a screwdriver slot operator accessible through face of register.
3. Minimum size is 4" x 4" (102 x 102).
   Maximum size is 48" x 36" (1219 x 914).
4. Type S Surface mount frame has a 1 1/4" (32) face border and a 1" (25) overlap margin.
5. Standard fastening is Type A countersunk screw holes.
6. Standard finish is AW Appliance White.

OPTIONS:

1. Finish:
   ☐ SP Special _____.
2. Fastening:
   ☐ Type C Concealed mounting straps
   ☐ Type N None.
3. ☐ PF Plaster frame
4. ☑ IS Insect screen
5. ☐ Other _____.

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

Dimensions are in inches (mm).

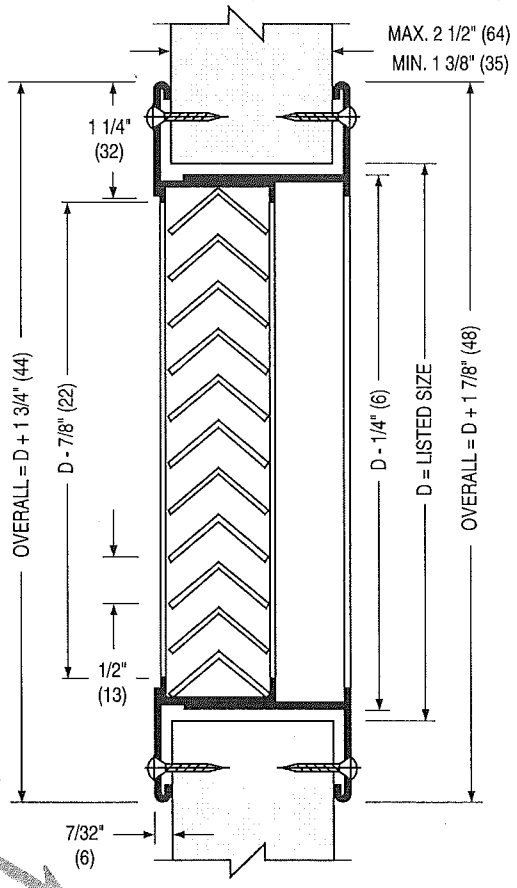
DATE	B SERIES	SUPERSEDES	DRAWING NO.
2 - 1 - 11	6100	6100-3A/17-10-00	6100-3

TAG: Door Grilles

Nailor® Industries Inc.

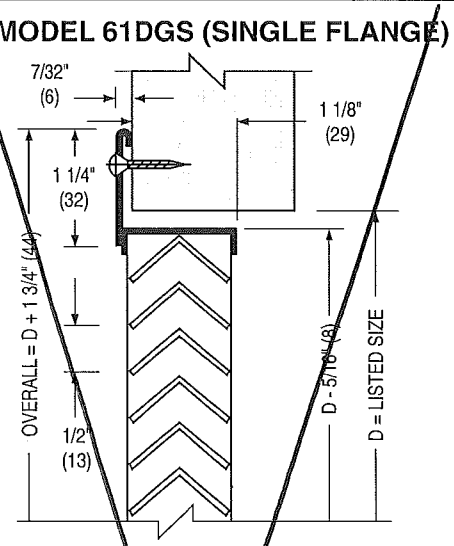
STEEL DOOR/~~TRANSFER~~ GRILLES
SIGHTPROOF
MODELS: 61DGD, ~~61DGS AND 61DGC~~

☑ MODEL 61DGD (DOUBLE FLANGE)



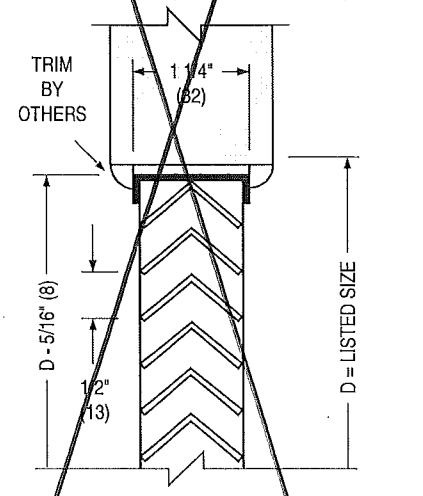
AUXILIARY FRAME ASSEMBLY

☐ MODEL 61DGS (SINGLE FLANGE)



CORE AND FLANGE FRAME ASSEMBLY

☐ MODEL 61DGC (CORE ONLY)



CORE AND CHANNEL FRAME ASSEMBLY

DESCRIPTION:

1. Construction: Corrosion-resistant steel. Roll-formed frame mechanically interlocked with reinforced mitered corners for strength. Heavy duty inverted 'V' louvers in 22 ga. (0.86) steel provides rigidity and strength and are mechanically locked in place using a double tab and slot method.
2. Model Series 61DG offers the largest free area possible with a completely sight-proof design, utilizing a 90° inverted 'V' louver on 1/2" (13) centers. Solid construction will tolerate abuse from bumps and kicks. The 61DG Series Door Grille may also be used as a transfer grille and in place of standard design exhaust and return air grilles where it is important that the interior of the plenum or duct be concealed.
3. Minimum size is 6" x 4" (152 x 102).
   Maximum size is 36" x 36" (914 x 914).
   Available in nominal 2" (51) increments.
4. Standard fastening is Type 'A' countersunk screw holes.
5. Standard finish is AW Appliance White.

OPTIONS:

1. Finish:
   ☐ SP Special _____.

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

Dimensions are in inches (mm).

DATE	B SERIES	SUPERSEDES	DRAWING NO.
2 - 1 - 11	6100	6100-9/11-8-07	61DG-1

HVAC Submittal Cover Sheet

SECTION: 4
PRODUCT: Gravity Ventilator Hoods with Motorized Dampers

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	United Enertech
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: GRAVITY VENTILATOR HOODS W/ MOTORIZED DAMPERS PAGE: 1 OF 1

MANUFACTURER: UNITED ENERTECH FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES

LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS

REMARKS: CUST: PAULSON-CHEEK MECHANICAL

TAG:	QTY:	MODEL:	DUTY:	THROAT:	CFM/S.P.:	ACCESSORIES:
GVH-6,7,8	3	GEV-4848	EXH(1:1)	48x48	12000/.07"	BS, CD-100-48x48-NF120

ACCESSORIES:

BS = BIRDSCREEN IS STANDARD.

CD-100-48x48-NF120 = 48"x48" MOTORIZED DAMPER W/ 120 VOLT, PO/SR TYPE MOTOR, INTERNAL MOUNT.

S

United Enertech

(ENGINEERS)

SUBMITTAL DATA

Ventilator Hoods

STANDARD SPECIFICATIONS

HOOD: 16 ga. (0.052") [1.32mm] Mill Finish Aluminum

BASE SECTION: 13 ga. (0.090") [2.29mm] Mill Finish Aluminum

BIRDSCREEN: 1/2" x .050" [12.70mm x 1.27mm] (0.051") [1.30mm] Flattened Aluminum (2B)

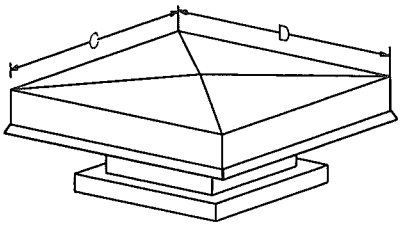
FINISH: Standard Mill

MINIMUM SIZE: 12" x 12" [305mm x 305mm]

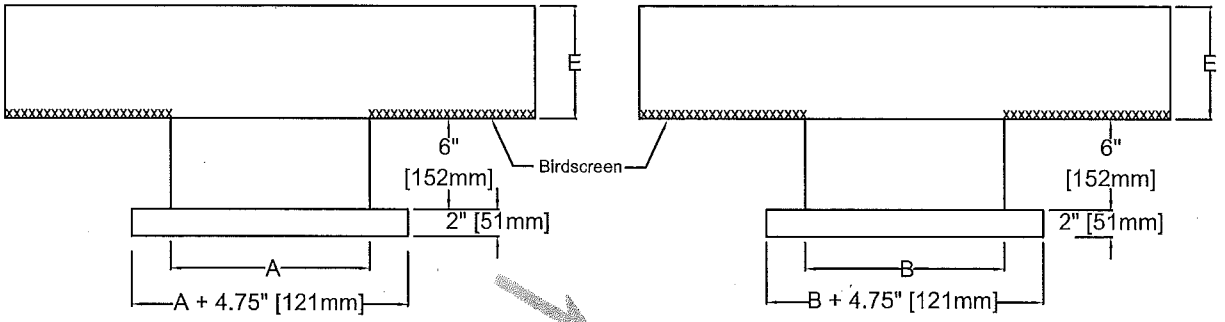
MAXIMUM SIZE: 60" x 120" [1524mm x 3048mm]

FRAMING: Under 12 Square Feet [1.11m²] Hood Area:
1-1/2" x 1-1/2" x 0.125" [38mm x 38mm x 3.18mm] 6063-T6 Extruded Aluminum Angle - All Welded

12 Sq. Ft. [1.11m²] through 40 Sq. Ft. [3.72m²]:
1-1/2" x 1-1/2" x 0.25" [38mm x 38mm x 6.35mm] 6063-T6 Extruded Aluminum Angle - All Welded



*See C&D dimensions on following pages



*These drawings are for dimensional purposes and may not represent actual construction.

Tag	Qty.	A	B	Hood-Throat Ratio	Options
GVH-6,7,8	3	48	48	1:1 (Exh)	M00

Options

- ☐ ~~Insulated Internal Hood~~
  - ☐ ~~Anti-Condensate Coating~~
  - ☐ ~~1" [25.40mm] Fiberglass Insulation~~
- ☐ ~~Hinged Lid (MAX 60" x 60" [1524mm x 1524mm] Throat)~~
- ☐ ~~Insect Screen~~
- ☐ ~~Roof Pitched - (____)/12" [305mm]~~
- ☐ ~~Galvanized Steel Construction~~
- ☐ ~~304 Stainless Steel Construction~~
- ☐ ~~Powder Coating~~
  - ☐ Polyester ☐ ~~Fluoropolymer 70%~~
- ☑ Dampers - ~~Backdraft or~~ Motor Operated
- ☐ ~~Filter Racks~~
- ☐ ~~Heavier Construction~~
- ☐ ~~Additional Throat Height~~
- ☐ ~~Hood Tie Downs (125 mph [201km/h] wind)~~

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

☒ **MODEL GEV (Exhaust)**
- ☒ 1:1 Ratio (100%)
- ☐ ~~1.5:1 Ratio (150%)~~

☐ ~~**MODEL GIV (Intake)**~~
- ☐ ~~1.75:1 Ratio (175%)~~
- ☐ ~~2:1 Ratio (200%)~~

DRAWN BY:	DATE:	REV. DATE:
SRB	12-03-99	7-29-13
REV. NO.	APPROVED BY:	DWG. NO.:
20	SDC	**B-11**

TABLE 1

MODEL GEV 1:1 (EXHAUST)

B= THROAT LENGTH IN INCHES	A= THROAT WIDTH IN INCHES									
	12	16	20	24	30	36	42	48	54	60
12	23, 23, 3									
16	23, 29, 3.5	29, 29, 4								
20	23, 34, 4	29, 34, 4.5	34, 34, 5							
24	23, 40, 4.5	29, 40, 5	34, 40, 5.5	40, 40, 6						
30	23, 48, 5.5	29, 48, 6	34, 48, 6.5	40, 48, 7	48, 48, 7.5					
36	23, 57, 6	29, 57, 6.5	34, 57, 7	40, 57, 7.5	48, 57, 8.5	57, 57, 9				
42	23, 65, 7	29, 65, 7.5	34, 65, 8	40, 65, 8.5	48, 65, 9	57, 65, 10	65, 65, 10.5			
48	23, 74, 7.5	29, 74, 8	34, 74, 8.5	40, 74, 9	48, 74, 10	57, 74, 10.5	65, 74, 11.5	74, 74, 12		
54	23, 82, 8.5	29, 82, 9	34, 82, 9	40, 82, 10	48, 82, 10.5	57, 82, 11.5	65, 82, 12	74, 82, 13	82, 82, 13.5	
60	23, 91, 9	29, 91, 9.5	34, 91, 10	40, 91, 10.5	48, 91, 11.5	57, 91, 12	65, 91, 13	74, 91, 13.5	82, 91, 14.5	91, 91, 15
72	23, 108, 10.5	29, 108, 11	34, 108, 11.5	40, 108, 12	48, 108, 13	57, 108, 13.5	65, 108, 14.5	74, 108, 15	82, 108, 16	91, 108, 16.5
84	23, 125, 12	29, 125, 12.5	34, 125, 13	40, 125, 13.5	48, 125, 14.5	57, 125, 15	65, 125, 16	74, 125, 16.5	82, 125, 17.5	91, 125, 18
96	23, 142, 13.5	29, 142, 14	34, 142, 14.5	40, 142, 15	48, 142, 16.5	57, 142, 16.5	65, 142, 17.5	74, 142, 18	82, 142, 19	91, 142, 19.5
108	23, 159, 15	29, 159, 15.5	34, 159, 16	40, 159, 16.5	48, 159, 17.5	57, 159, 18	65, 159, 19	74, 159, 19.5	82, 159, 20.5	91, 159, 21
120	23, 176, 16.5	29, 176, 17	34, 176, 17.5	40, 176, 18	48, 176, 19	57, 176, 19.5	65, 176, 20.5	74, 176, 22	82, 176, 22	91, 176, 22.5

This table displays dimensions C, D, & E
Example: A x B = 12 x 12
23, 23, 3
C, D, E

TABLE 2

MODEL GEV 1.5:1 (EXHAUST)

B= THROAT LENGTH IN INCHES	A= THROAT WIDTH IN INCHES									
	12	16	20	24	30	36	42	48	54	60
12	24, 24, 4.5									
16	24, 30, 5.5	30, 30, 6								
20	24, 37, 6	30, 37, 7	37, 37, 7.5							
24	24, 43, 7	30, 43, 7.5	37, 43, 8.5	43, 43, 9						
30	24, 52, 8	30, 52, 8	37, 52, 9.5	43, 52, 10.5	52, 52, 10.5					
36	24, 62, 9	30, 62, 10	37, 62, 10.5	43, 62, 11.5	52, 62, 11.5	62, 62, 13.5				
42	24, 71, 10.5	30, 71, 12	37, 71, 12	43, 71, 12	52, 71, 12.5	62, 71, 15	71, 71, 16			
48	24, 81, 11.5	30, 81, 12	37, 81, 13	43, 81, 13	52, 81, 13.5	62, 81, 16	71, 81, 17	81, 81, 18		
54	24, 90, 12.5	30, 90, 13.5	37, 90, 14	43, 90, 15	52, 90, 15	62, 90, 17	71, 90, 18	81, 90, 19.5	90, 90, 20.5	
60	24, 100, 13.5	30, 100, 14.5	37, 100, 15	43, 100, 16	52, 100, 16	62, 100, 18	71, 100, 19.5	81, 100, 20.5	90, 100, 21.5	100, 100, 22.5
72	24, 119, 16	30, 119, 16.5	37, 119, 17.5	43, 119, 18	52, 119, 18	62, 119, 20.5	71, 119, 21.5	81, 119, 22.5	90, 119, 24	100, 119, 25
84	24, 138, 18	30, 138, 19	37, 138, 19.5	43, 138, 20.5	52, 138, 20.5	62, 138, 22.5	71, 138, 24	81, 138, 25	90, 138, 26	100, 138, 27
96	24, 157, 20.5	30, 157, 21	37, 157, 22	43, 157, 22.5	52, 157, 24	62, 157, 25	71, 157, 26	81, 157, 27	90, 157, 28.5	100, 157, 29.5
108	24, 176, 22.5	30, 176, 23.5	37, 176, 24	43, 176, 25	52, 176, 26	62, 176, 27	71, 176, 28.5	81, 176, 29.5	90, 176, 30.5	100, 176, 31.5
120	24, 195, 25	30, 195, 25.5	37, 195, 26.5	43, 195, 27	52, 195, 28.5	62, 195, 29.5	71, 195, 30.5	81, 195, 31.5	90, 195, 33	100, 195, 34

This table displays dimensions C, D, & E
Example: A x B = 20 x 24
37, 43, 8.5
C, D, E

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

SIZING CHARTS
Models GEV, ~~GIV~~

DRAWN BY:	DATE:	REV. DATE:
TBL	12-28-07	01-08-09
REV. NO.	APPROVED BY:	DWG. NO.:
1	BGT	F-7

United Enertech

(ENGINEERS)
SUBMITTAL DATA

Models GEV, ~~GIV~~
Static Pressure Loss

MODELS GEV, ~~GIV~~
STATIC PRESSURE LOSS (Inches w.g.)(ducted system)

Throat Velocity	100% (1:1 Ratio)	150% (1.5:1 Ratio)	175% (1.75:1 Ratio)	200% (2:1 Ratio)
	EXHAUST	EXHAUST	INTAKE	*INTAKE
300 FPM	.015	.005	.006	.005
400 FPM	.024	.011	.014	.013
500 FPM	.032	.013	.025	.021
600 FPM	.045	.020	.039	.034
700 FPM	.060	.035	.053	.051
800 FPM	.080	.047	.068	.066
900 FPM	.106	.065	.094	.086
1000 FPM	.133	.084	.118	.106
1100 FPM	.164	.103	.141	.129
1200 FPM	.198	.123	.166	.153

Note: add 78% to pressure loss if non-ducted for sudden expansion at throat.

Add to above *.03 - 18 mesh insect screen
*.02 - washable 1" filter (initial resistance)
*.04 - washable 2" filter (initial resistance)

Note: Intake ventilators "Hood velocity" should not exceed 600 FPM

NOTES:

(1) Given Hood Velocity (FPM)
to Throat Velocity (FPM) x 1 = 100% Free Area
x 1.5 = 150% Free Area
x 1.75 = 175% Free Area
x 2 = 200% Free Area
Example: 600 FPM Hood Velocity FPM x 2 (200%) = 1200 FPM Throat FPM

(2) Given Throat Velocity (FPM)
to Hood Velocity (FPM) / 1 = 100% Free Area
/ 1.5 = 150% Free Area
/ 1.75 = 175% Free Area
/ 2 = 200% Free Area
Example: 1200 FPM Throat Velocity FPM / 2 (200%) = 600 FPM Hood FPM

(3) Throat Size
CFM / Throat Velocity (FPM) yields S.F. of Throat
Example:9000 CFM / 1000 Throat FPM = 9 Sq. Ft.

(Example): CFM Throat Velocity (Given)
9000 CFM
9000 CFM / 1000 Throat FPM = 9 Sq. Ft. Throat size required
9 Sq. Ft. = 36" x 36" Throat size

See above table for pressure loss
1000 FPM (Throat Intake) 200% = .106 w.g. (ducted)

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

DRAWN BY:	DATE:	REV. DATE:
CLJ		11-3-06
REV. NO.	APPROVED BY:	DWG. NO.:
6	BGT	**F-10**

6/18/2015

Page Revised 9

United Enertech

(ENGINEERS)

SUBMITTAL DATA

CONTROL DAMPERS

Standard Blade

OPPOSED BLADE ~~PARALLEL BLADE~~ DAMPER

Suggested Specifications:

Furnish and install at location shown on drawing or in accordance with schedules dampers meeting the following specifications: Rectangular damper shall have .125" extruded aluminum blades and .081" extruded aluminum frame. CD-100, 101 meets the leakage requirements for Minimum AntiTerrorism Standards for Buildings (UFC 4-010-01, section B-4.2.3, max. leakage rates of 3 cfm/sq. ft. with differential pressure of 1" w.g.). Blade and jamb seals must be used to achieve optimal leakage rating. Damper to have thrust bushings and meet the low pressure drop equal to United Enertech MODEL CD-100 or CD-101.

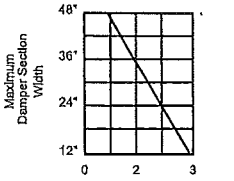
FPM Table

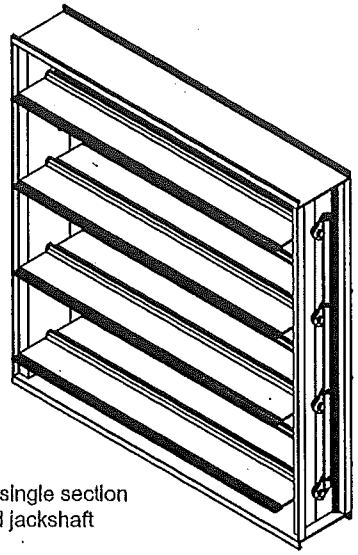
12" wide	- 2600 FPM
24"	- 2200
36"	- 2000
48"	- 1700
52"	- 1600

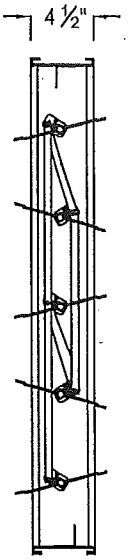
Jackshafting provided over 52" wide

Pressure - up to 3" w.g. - See pressure limit table

Pressure Limitations







Undersized 1/4"

Standard Construction:

Frame: .081 Extruded Aluminum

Blade: .125 Extruded Aluminum

Bearing: Nylon

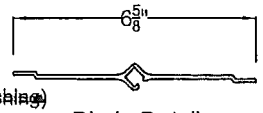
Linkage: Concealed in frame

Axles: 3/8" square, zinc plated steel

Control Shaft: ½" x 6" long outboard support bearing supplied with all single section dampers for field mounted actuators. Factory-installed jackshaft supplied with all multi-section dampers.

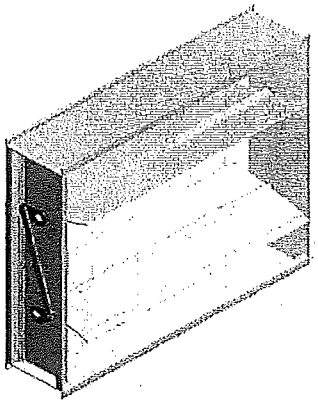
Options:

- ☐ ~~.125 Extruded Aluminum Frame (box frame)~~
- ☐ ~~1 1/2" .125 Extruded Aluminum Flanged Frame~~
- ☐ ~~Bronze Bushing~~
- ☐ ~~Blade Seals PVC (175°F)~~
- ☐ ~~Blade Seals Silicone (400°F & 304 Stainless Steel Bushing)~~
- ☐ Low Leakage TPV Jamb Seals
- ☐ ~~Low Leakage Silicone Jamb Seals (400°F)~~
- ☐ ~~Compression Jamb Seals (stainless steel)~~
- ☐ ~~Header Plates (End Flange)~~
- ☐ ~~Hand Quadrant~~
- ☑ Factory Installed ~~Pneumatic or~~ Electric Actuators (see cat. sheet H-1)
- ☐ ~~Stand-Off Brackets 2"~~
- ☐ ~~Position Switch~~
- ☐ ~~Face and By-pass Damper~~
- ☐ ~~Chain Operator~~
- ☐ ~~Heresite coated (air dry)~~
- ☐ ~~Epoxy coated (powder coated @ 415°)~~
- ☐ ~~Weather Shield Enclosure for Actuator~~
- ☐ ~~Explosion-proof Enclosure for Actuator~~



Blade Detail

Minimum Size: 5"w x 4"h
8" and under single blade
Maximum Size: 52"w x 72"h (single section)
Multi-section: unlimited



INDEPENDENT LABORATORY CERTIFIED air leakage AMCA standard 668 Certaire Technical Services, LTD.

size tested: 36"w x 36"h
12"w x 12"h

INDEPENDENT LABORATORY CERTIFIED air performance AMCA standard 668 Certaire Technical Services, LTD.

size tested: 36"w x 36"h
12"w x 12"h

Due to continuing research, United Enertech reserves the right to change specifications without notice.

☒ MODEL CD-100 (Opposed)

☐ ~~MODEL CD-101 (Parallel)~~

DRAWN BY: CLJ	DATE: 11-20-01	REV. DATE: 7-19-12
REV. NO. 43	APPROVED BY: BGT	DWG. NO.: A1

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

6/18/2015

Model CD-100, ~~CD-101~~ Damper Performance Data

LEAKAGE PERFORMANCE

United Enertech certifies that the CD-100-I, CD-101-I is licensed to bear the Certaire Certified Air Ratings Seal. The ratings shown are based on tests made in accordance with AMCA standard 500.

Damper Width X Height	1 in. w.g. Class	4 in. w.g. Class	8 in. wg Class
12" x 12"	3.6 (Class 1A)	7.6 (Class 1A)	10.3 (Class 1A
36" x 36"	0.5 (Class 1A)	5.6 (Class 1A)	20.8 (Class 1A

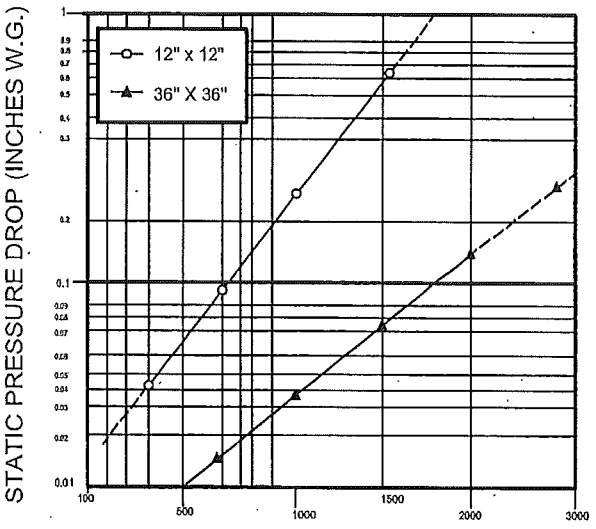
Note: At 1" w.g. 12"x12" damper leaks 3.6 cfm per square foot.
Note: At 1" w.g. 36"x36" damper leaks 0.5 cfm per square foot.

AMCA STANDARDS

Pressure Class	Leakage, ft³/min /ft²			
	Required Rating		Extended Ranges (optional)	
	0.25 kPa (1")	1.0 kPa (4")	2.0 kPa (8")	3.0 kPa (12")
1A	15.2 (3)	40.6 (8)	55.9 (11)	71.1 (14)
1	20.3 (3)	40.6 (8)	55.9 (11)	71.1 (14)
2	50.8 (10)	102 (20)	142 (28)	178 (35)
3	203 (40)	406 (80)	569 (112)	711 (140)

Leakage Classification per AMCA publication 511-99

PRESSURE DROP



Based on STANDARD AIR- .075 lb. per cubic foot.

12" x 12" (305mm x 305mm)

Face Velocity ft/min (m/s)	Pressure drop w.g. (PA)
407 (2.0)	.040 (1.24)
820 (4.1)	.150 (4.97)
1234 (6.3)	.340 (12.42)
1641 (8.3)	.610 (22.35)
2057 (10.4)	.950 (34.77)

36" x 36" (914mm x 914mm)

Face Velocity ft/min (m/s)	Pressure drop w.g. (PA)
392 (1.99)	.005 (1.24)
789 (4.01)	.02 (4.97)
1208 (6.14)	.05 (12.42)
1598 (8.12)	.09 (22.35)
2006 (10.19)	.14 (34.77)

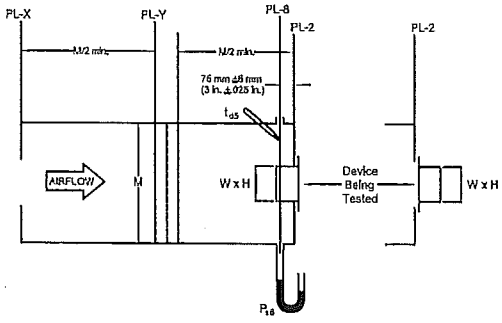


Figure 5.5- Test Device Setup with Inlet Chamber

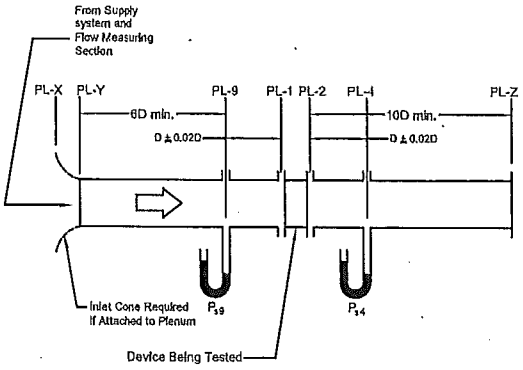
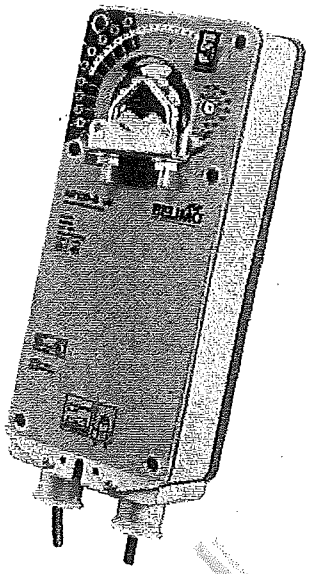


Figure 5.3- Test Device Setup with Inlet and Outlet Ducts

NF120(-S) US

On/Off, Spring Return Fail-Safe, 120 VAC

BELIMO



Torque min. 60 in-lb, for control of air dampers

Application

For On/Off, fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. Control is On/Off from an auxiliary contact, or a manual switch.

The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

Operation

The NF series actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator.

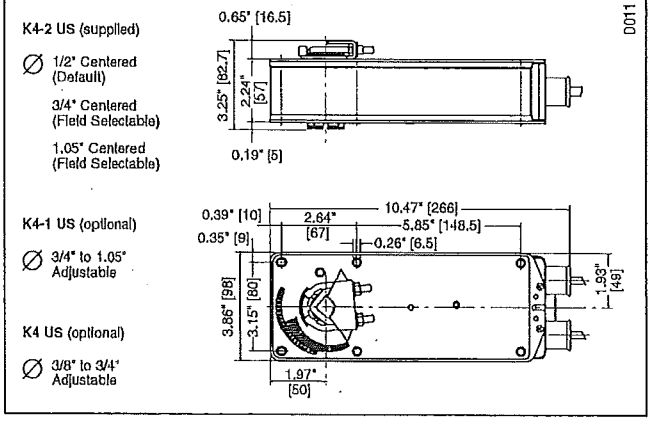
The NF series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°.

The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches.

The NF120-S US versions are provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 5° and 85°.

Technical Data		NF120(-S) US
Power supply		120 VAC ± 10% 50/60 Hz
Power consumption	running	7 W
	holding	4 W
Transformer sizing		9.5 VA
Electrical connection		3 ft, 18 GA appliance cable 1/2" conduit connector
Overload protection		Electronic throughout 0 to 95° rotation
Electrical protection		Auxiliary switches are double insulated
Angle of rotation		95°, adjustable 30 to 95° w/ accessories
Torque		60 in-lb [7 Nm] constant torque
Direction of rotation		reversible with CW/CCW mounting
Position indication		visual indicator, 0° to 95° (0° is spring return position)
Running time (nominal)	motor	< 75 sec
	spring	< 60 sec
Humidity		5 to 95% RH non-condensing
Ambient temperature		-22°F to 122°F [-30°C to 50°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA type 2 / IP54
Housing material		zinc coated steel
Agency listings		cULus acc. to UL 873 and CAN/CSA C22.2 No. 24-93
Noise level		max. 45 dB (A)
Servicing		maintenance free
Quality standard		ISO 9001
Weight		7.3 lbs (3.3 kg)
NF120-S		
Auxiliary switches		1 x SPDT 7A (2.5A) @ 250 VAC, UL Approved, adjustable 5° to 85°

Dimensions (Inches [mm])



Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

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Accessories

AV 10-18	Shaft extension
IND-AF2	Damper position indicator
K4-1 US	Universal clamp for up to 1.05" dia jackshafts
K4-H	Universal clamp for hexshafts 3/8" to 5/8"
KH-AF	Crankarm for up to 3/4" round shaft
KH-AF-1	Crankarm for up to 1.05" jackshaft
KH-AFV	V-bolt kit for KH-AF and KH-AF-1
Tool-06	8mm and 10 mm wrench
ZG-HTR	Thermostat/Heater Kit
ZDB-AF2 US	Angle of rotation limiter
ZG-100	Universal mounting bracket
ZG-101	Universal mounting bracket
ZG-102	Multiple actuator mounting bracket
ZG-106	Mounting bracket for Honeywell® Mod IV replacement or new crankarm type installations
ZG-107	Mounting bracket for Honeywell® Mod III or Johnson® Series 100 replacement or new crankarm type installations
ZG-108	Mounting bracket for Barber Colman® MA 3../4.., Honeywell® Mod III or IV or Johnson® Series 100 replacement or new crankarm type installations
ZG-AF US	Crankarm adaptor kit for AF/NF
ZG-AF108	Crankarm adaptor kit for AF/NF
ZS-100	Weather shield (metal)
ZS-150	Weather shield (polycarbonate)
ZS-260	Explosion-proof housing
ZS-300	NEMA 4X housing

NOTE: When using NF120 US and NF120-S actuators, only use accessories listed on this page. For Actuator Wiring Information and Diagrams, Please See Belimo Wiring Guide (pg 349).

Typical Specification

On/Off spring return damper actuators shall be direct coupled type which require no crankarm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, 1 SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be UL Approved and CSA certified, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

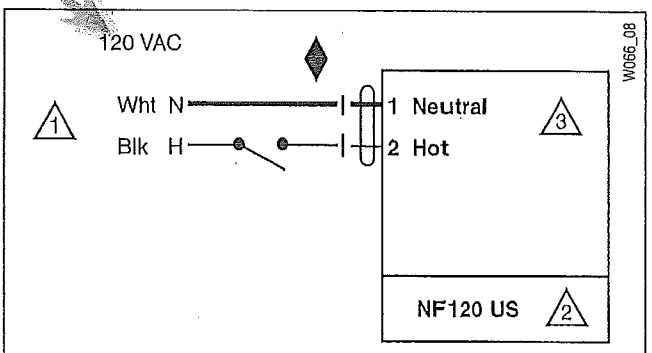
INSTALLATION NOTES

1. Provide overload protection and disconnect as required.
2. ***CAUTION** Equipment damage!*
   Actuators may be connected in parallel.
   Power consumption and input impedance must be observed.
3. No ground connection is required.
4. For end position indication, interlock control, fan startup, etc., NF-20-S US incorporates one built-in auxiliary switch: 1 x SPDT, 7A (2.5A) @250 VAC, UL Approved, adjustable 5° to 85°.

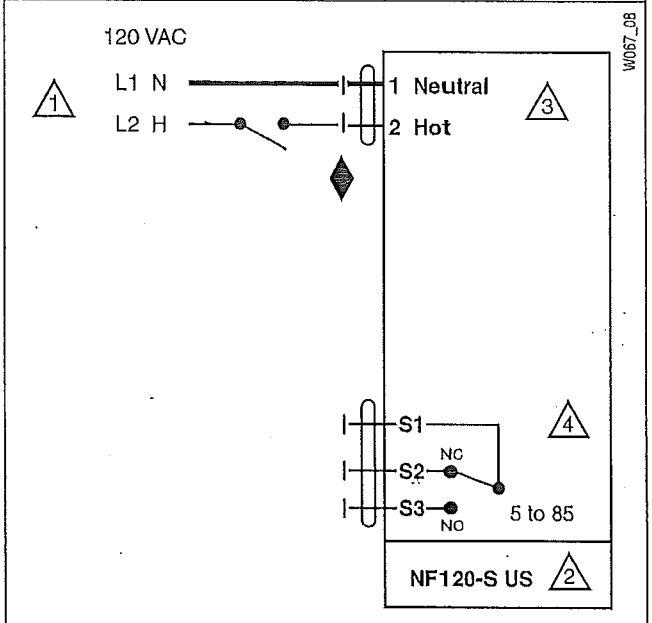
APPLICATION NOTES

- Meets cULus requirements without the need of an electrical ground connection.

***WARNING** Live Electrical Components!*
During installation, testing, servicing and troubleshooting of this product, it maybe necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



On/Off wiring for NF120 US



On/Off wiring for NF120-S US

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

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HVAC Submittal Cover Sheet

SECTION: 5
PRODUCT: Roof Exhaust Fan

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Pennbarry
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: ROOF EXHAUST FAN PAGE: 1 OF 1

MANUFACTURER: PENNBARRY FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES

LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS

REMARKS: CUST: PAULSON-CHEEK MECHANICAL

TAG:	QTY:	MODEL:	CFM:	S.P.:	HP:	VOLTAGE:	ACCESSORIES:
EF-1	1	DX11R	659	.125"	1/7	115/1/60	BDD

ACCESSORIES:

BDD = GRAVITY BACKDRAFT DAMPER.

NOTE: ALUMINUM BIRDSCREEN AND FACTORY-WIRED DISCONNECT ARE STANDARD.

General Fan Schedule

Job Name: Medline - Lines 7 & 8

Job Notes:

PENN BARRY

Tag /Mark	EF-1				
QTY	1				
Product Line	Domex				
Model	DX11R				
Drive	Direct				
Flow Rate- (CFM)	659				
SP - ("w.g.)	0.13				
Temperature - (F)	70				
Altitude - (ft.)	0				
RPM	1550				
BHP/Watts	0.12				
Motor	1/7 HP 115/1/60 Open				
Tip Speed - (ft/min)	4512				
Inlet Vel (ft/min)	1883				
Outlet Vel (ft/min)	679				
SE%	10.99				
ME%	13.52				
Sones	6.44				
NC	50				
dBA	53				
Mounting Position	Roof				
Application	Exhaust				
Fan Notes					
Ro/Opng - (in)	11.50				
Dmpr.O.D.(in)	11.25				
Shipping W. - (lbs)	38				
Accessories:					
1	Aluminum Bird Screen				
2	Gravity Backdraft Damper				
3	NEMA 1 Internal Wiring				
4	Plug Disconnect				
5	Thermal Overload Protection				
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
Specials:					

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

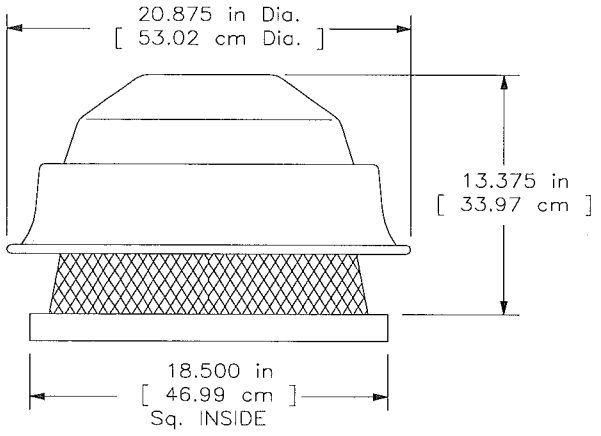
PennBarry
1401 N. Plano Road
Richardson, TX 75081

Job Name: Medline - Lines 7 & 8
Tag / Mark: EF-1
Date: 5/20/2015

DIRECT DRIVE CENTRIFUGAL ROOF EXHAUST FAN

STANDARD CONSTRUCTION

Aluminum housing * Backward inclined centrifugal aluminum wheel * Birdscreen * Galvanized (aluminum optional) pre-punched base with welded corners * Oversized electrical chase * Pre-wired junction box including electrical disconnect "plug" (except Explosion Proof) * Motors continuous duty, ball bearing design, automatic reset thermal overload protection (except Explosion Proof), mounted out of the airstream * Corrosion resistant fasteners *



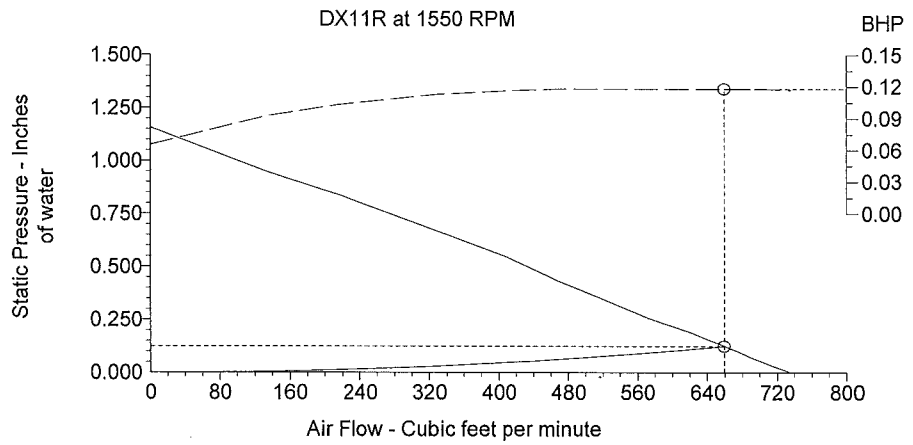
Note: All Dimensions shown are in units of inches

PERFORMANCE						
Qty	Model	Volume (CFM)	SP (in. w.c.)	RPM	BHP/Watts	TipSpeed
1	DX11R	659	0.13	1,550	0.12	4,512

MOTOR INFORMATION		
Motor HP	Volt/Ph/Hz	Enclosure
1/7	115/1/60	Open

DIMENSIONS		
Damper Size (in.)	Ro\Opng (in.)	Shipping Wgt. (lbs)
11.25X11.25	11.5X11.5	38

SOUND POWER (dB re 10^{-12})								LwA	Dba	Sones
OCTAVE POWER CENTER FREQUENCY (hz)										
63	125	250	500	1000	2000	4000	8000			
65	73	69	55	57	55	46	36	50	53	6.4



Accessories:

1) Aluminum Bird Screen
2) Gravity Backdraft Damper
3) NEMA 1 Internal Wiring
4) Plug Disconnect
5) Thermal Overload Protection

HVAC Submittal Cover Sheet

SECTION: 6
PRODUCT: Roof Curbs

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	United Enertech
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

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CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: ROOF CURBS PAGE: 1 OF 1

MANUFACTURER: UNITED ENERTECH FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES

LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS

REMARKS: CUST: PAULSON-CHEEK MECHANICAL

QTY:	MODEL:	CURB OD:	CURB ID:	HEIGHT:	SLOPE:	TAG:
3	UCC-3-52x52	52x52	49x49	12"	Flat*	GVH-6,7,8
1	UCC-3-17x17	17x17	14x14	12"	Flat*	EF-1

NOTES:

1) * Roof curbs are for a flat, conventional roof. (Please Verify)

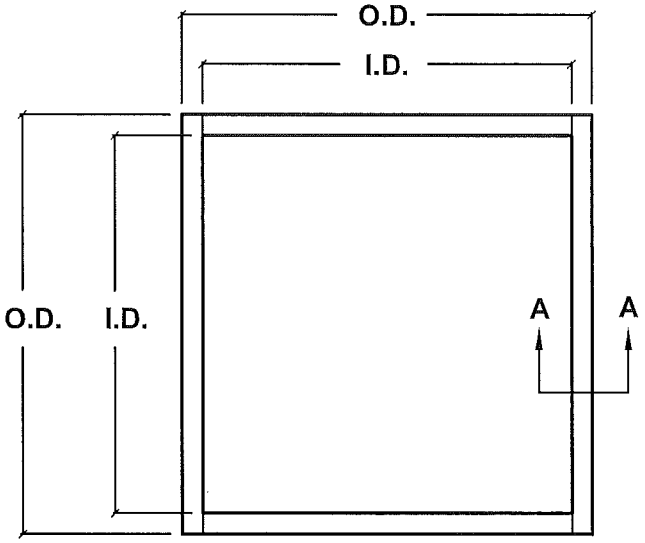
17

Model: UCC-3

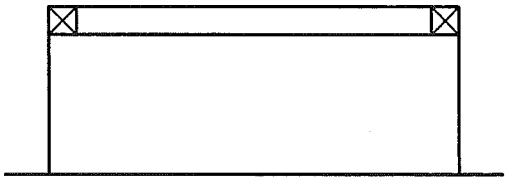
Conventional Roof Curb

Standard Construction:

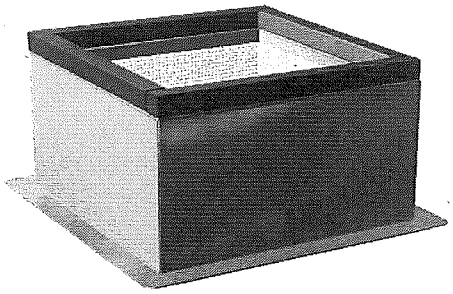
One-piece curb with 18 ga. Galvanized steel shell and baseplate; 12" minimum height, 2 x 2 pressure treated wood nailer, insulated, internal angle reinforcing with welded corners. 2" mounting flange. Self flashing for single-ply EPDM roofing.

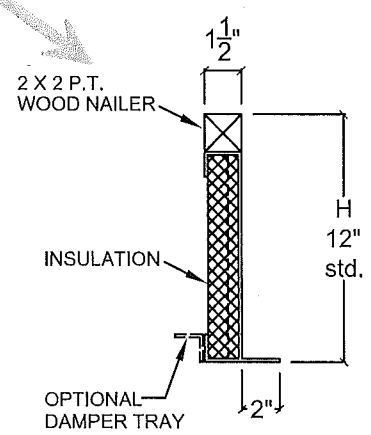


PLAN



ELEVATION





SECTION "A-A"
UCC-3

NOTE: Due to continuing research, United Enertech reserves the right to change specifications without notice.

Qty.	I.D.	O.D.
	see schedule	

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

DRAWN BY:	DATE:	REV. NO.	REV. DATE:	APPROVED BY:	DWG. NO.:
CLJ	8-3-06	6	12-23-10	CBY	M-3

HVAC Submittal Cover Sheet

SECTION: 7
PRODUCT: Drop Box Diffuser

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	United Enertech
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

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CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: DROP BOX DIFFUSERS PAGE: 1 OF 1

MANUFACTURER: UNITED ENERTECH FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES

LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS

REMARKS: CUST: PAULSON-CHEEK MECHANICAL

TAG: DROP BOX DIFFUSER @ 30 TON (12,000 CFM) UNIT

(1) UNITED ENERTECH MODEL DPD-5010-30.
12000 CFM (30 TON).
(4) 50x10 DRUM LOUVERS.
(1) 38"x38" DUCT CONNECTION.

TAG: DROP BOX DIFFUSERS @ 50 TON (20,000 CFM) UNITS

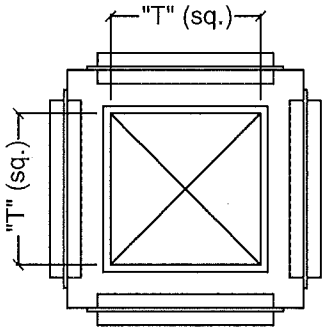
(2) UNITED ENERTECH MODEL DPD-7012-50.
20000 CFM (50 TON).
(4) 70x12 DRUM LOUVERS.
(1) 48"x48" DUCT CONNECTION.

United Enertech

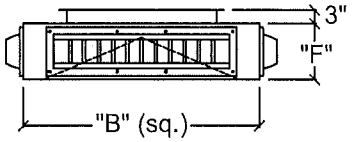
(ENGINEERS)

SUBMITTAL DATA

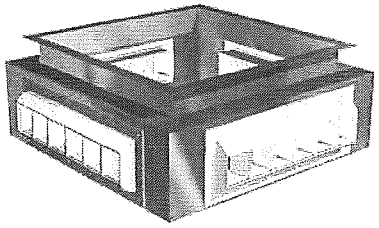
Drop Diffuser/Plenums



PLAN



ELEVATION



STANDARD FEATURES:

- ☑ *Drum Louvers
- ☑ 1" Ultra Lite Duct Liner
- ☑ TDC Duct Connection
- ☑ Galvanized Steel Construction:
  24 gauge DPD 1206-5 thru 2510-15
  20 gauge DPD 3510-20 thru 6012-40
  18 gauge DPD 7012-50 thru 7215-62.5

OPTIONS:

- ☐ Custom Built up to 200,000 cfm
- ☐ Powder Coated
- ☐ 3/8" Nut Insert at each corner for mounting
- ☐ "Premium Performance" -360° rotating drop diffuser (1.5 RPM- Electric motor driven)
  (Note: duct connection changes to round-equivalent square)
- ☐ Omit pyramid center air diverter
- ☑ Omit Insulation

QTY	MODEL #	"T" (sq.)	"B"	"F"	GRILLE SIZE	NOMINAL CFM	TONS	*THROW	N.C.	VELOCITY PRESSURE in w.g.	TOTAL PRESSURE in w.g. @ zero deflection
	DPD1206-5	14"	22"	9"	12" x 6"	2,000	5	35-43-61	43	.062	.433
	DPD1806-7.5	20"	28"	9"	18" x 6"	3,000	7.5	43-53-74	44	.062	.370
	DPD3006-10	22"	40"	9"	30" x 6"	4,000	10	50-61-86	38	.040	.205
	DPD2010-12.5	24"	30"	13"	20" x 10"	5,000	12.5	52-65-91	44	.059	.290
	DPD2510-15	28"	35"	13"	25" x 10"	6,000	15	60-73-101	41	.049	.201
	DPD3510-20	30"	45"	13"	35" x 10"	8,000	20	71-88-122	41	.041	.170
	DPD4010-25	36"	50"	13"	40" x 10"	10,000	25	76-93-131	36	.031	.159
1	DPD5010-30	38"	60"	13"	50" x 10"	12,000	30	86-105-149	38	.032	.160
	DPD6012-40	40"	70"	15"	60" x 12"	16,000	40	88-108-154	40	.031	.159
2	DPD7012-50	48"	80"	15"	70" x 12"	20,000	50	89-110-159	42	.032	.160
	DPD7215-62.5	52"	82"	18"	72" x 15"	25,000	62.5	110-137-190	44	.041	.118

*Throws based on 150-100-50 FPM terminal velocities with aid of a ceiling.

ISOTHERMAL CONDITIONS @ ZERO DEFLECTION

3 ft. below ceiling reduces throw 10% isothermal
4 ft. below ceiling reduces throw 20% isothermal
no ceiling reduces throw 30% isothermal

cold supply (20°F ΔT) reduces horizontal throw 30% while increasing vertical throw by 30%
warm air (20°F ΔT) increases horizontal throw 30% while reducing vertical throw by 30%

CORRECTION FACTOR

Deflection	15°	30°
NC	+4	+9
Throw	x .85	x .73
Total Pressure	x 1.5	x 1.9

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

☒ MODEL DPD — *Drum Louver Plenum Diffuser*

DRAWN BY:	DATE:	REV. DATE:
CLJ	9-1-99	5-29-12
REV. NO.	APPROVED BY:	DWG. NO.:
10	CLJ	**H-1**

20

HVAC Submittal Cover Sheet

SECTION: 8
PRODUCT: Wall Intake Louvers

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	United Enertech
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: WALL INTAKE LOUVERS PAGE: 1 OF 1

MANUFACTURER: UNITED ENERTECH FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II – LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES
LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS
REMARKS: CUST: PAULSON-CHEEK MECHANICAL

ITEM	QTY.	MODEL	DRAWING	WIDTH	HEIGHT	MARK
		AFL-D-4	A-25			
		CHANNEL FRAME, ½" UNDERSIZED, ¾" MESH .051" ALUMINUM BIRDSCREEN, MILL FINISH				
		(2) SIEMENS GCA221.1U MOTORS*, INTERNAL MOUNT				
1	2			108"	120"	WL-1,2

NOTES:

1) LOUVERS ARE UNDERSIZED BY ½" IN BOTH DIMENSIONS.

2) MOTORS ARE 120 VOLT, PO/SR TYPE, INTERNAL MOUNT.

3) LOUVERS ARE SUBMITTED WITH STANDARD MILL FINISH.

MODEL AFL-D-4 HIGH PERFORMANCE ADJUSTABLE LOUVER 4"

STANDARD CONSTRUCTION:

FRAME:
.081 Extruded Aluminum 4.25" deep.

BLADES:
.081 Extruded Aluminum Positioned on a 37° angle on approximately 2.88" centers.

LINKAGE:
In Airstream

BIRDSCREEN:
.75" X .051 Flattened Aluminum in Removable Frame.
Screen is mounted on inside (rear) as looking from exterior of building.

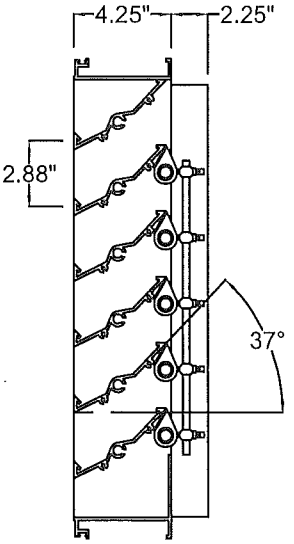
OPERATOR:
Louvers without actuators will be supplied with Locking Quadrants

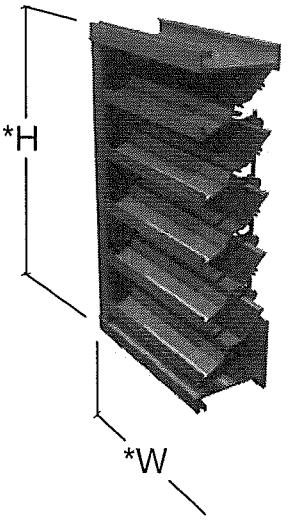
FINISH:
Mill Aluminum (Std.)

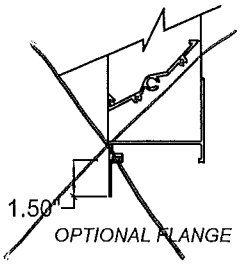
MINIMUM SIZE:
12"w x 12"h

MAXIMUM SIZE:
60"w x 96"h single section, Multiple louvers can be bolted together up to 120"w x 84" h or 84"w x 120"h. Factory assembled multi-section max: 108"w x48"h. Larger sizes are field assembled.

AMCA CERTIFIED RATINGS — WATER PENETRATION — AIR PERFORMANCE — AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.







OPTIONAL FLANGE

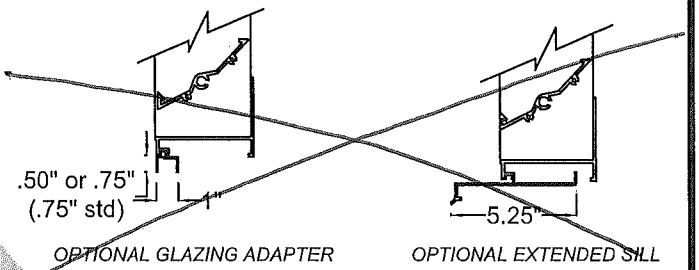
OPTIONS:

- ☒ Flanged Frame (1.5" std.)
- ☐ Custom Flange (1", 2", or 3")
- ☐ Glazing Adapter (.50" or .75")
- ☐ Extended Sill
- ☐ Insect Screen (Other Screens Available, See Screen Page)
- ☐ Filter Racks (no screen)
- ☐ Security Bars
- ☐ Blade Seals (EPDM)
- ☐ Jamb Seals (Stainless Steel)
- ☐ Hinged Sub Frame
- ☒ Actuator: See Actuator Selection Chart

AVAILABLE FINISHES:

- ☐ **Powder Polyester TGIC** (2 coats) baked on at 410°F, 2.5 to 3.5 mils Meets AAMA-2603 Standards
- ☐ **Powder Super durable polyester** (2 coats) baked on at 410°F, 2.5 to 3.5 mils Meets AAMA-2604-05 Standards
- ☐ **Acrylic baked enamel** (ACRA-BOND® ULTRA) by AkzoNobel baked on at 350°F, 0.8 to 1.2 mils dry Meets AAMA-2603 Standards
- ☐ **Kynar®** (ALUM*A*STAR®) 2 coats by AkzoNobel baked on at 450°F, 1.2 to 1.6 mils dry Meets AAMA-2604-05 Standards
- ☐ **Kynar 500®** or HYLAR® 5000 70% TRINAR® (2 coats) by AkzoNobel baked on at 450°F, 1.2 to 1.6 mils dry, Meets AAMA-2605-05 Standards
- ☐ **Kynar 500®** or HYLAR® 5000 (70% Tri-Escent II) (2 coats) by AkzoNobel, a superior finish to other metallic or anodized finishes. A blend of mica, ceramic, and inorganic pigments creates subtle yet dazzling design that goes beyond metallic color without the requirement of a clear coat. 14 standard colors - custom colors available. Baked on at 415°F, 1.4 to 1.8 mils dry, meets AAMA 2605-05.
- ☐ **Clear Anodize** 204 R-1 Class II (AA-C22A31)(0.4 to 0.7 mil)
- ☐ **Clear Anodize** 215 R-1 Class I (AA-C22A41)(>0.7 mil)
- ☐ **Integral Color Anodize** (AA-C22A42)(>0.7 mil)

- Clear coat available for all above finishes.
- Hylar® 5000 is a registered trademark of Solvay Solexis, Inc.
- Kynar® 500 is a registered trademark of Arkema.
- ALUM*A*STAR® 50 and TRINAR® are registered trademarks of AkzoNobel
- ACRA-BOND® ULTRA is a registered trademark of AkzoNobel



OPTIONAL GLAZING ADAPTER — OPTIONAL EXTENDED SILL

*Width and Height dimensions are approximately 1/4" under listed size.

Due to continuing research, United Enertech reserves the right to change specifications without notice.

United Enertech
3005 South Hickory Street
Chattanooga, Tennessee 37407
Tel: (423) 698-7715
Fax: (423) 698-6629
www.unitedenertech.com

MODEL AFL-D-4 (High Performance Adjustable Louver 4")

DRAWN BY:	DATE:	REV. DATE:	REV. NO.	APPROVED BY:	DWG. NO.:
CLJ	APRIL 1998	February 2011	8	BGT	A-25

SUGGESTED SPECIFICATION

Furnish and install louvers as hereinafter specified where shown on plans or as described in schedules. Louvers shall be adjustable drainable type with drain gutters in each blade and downspouts in jambs and mullions. adjustable drainable blades shall be contained within a 4.25" frame. Louver components (heads, jambs, sills, blades, and mullions) shall be factory assembled by the louver manufacturer. Louver sizes too large for shipping shall be built up by the contractor from factory assembled louver sections to provide overall sizes required. Louver design shall incorporate structural supports required to withstand a wind load of 30 lbs. Per sq. ft. (equivalent of a 110 mph wind).

Louvers shall be United Enertech #AFL-D-4 6063T6 extruded aluminum construction as follows:

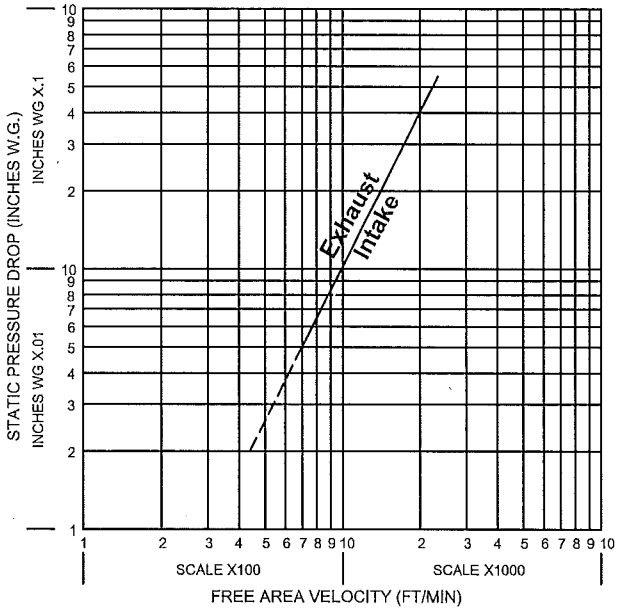
Frame: 4.25" deep, .081 nominal wall thickness.
Blades: .081 nominal wall thickness. Drainable.
Blades are positioned at 37-degree angle and spaced approximately 2.88 center to center.
Screen: .75" x .051" (19 x 1.3) expanded, flattened aluminum in removable frame.
Finish: Select finish specification from United Enertech Finishes Brochure.

PERFORMANCE DATA

AMCA Standard 500-L provides a reasonable basis for testing and rating louvers. Testing to AMCA 500-L is performed under a certain set of laboratory conditions. This does not guarantee that other conditions will not occur in the actual environment where louvers must operate.

The louver system should be designed with a reasonable safety factor for louver performance. To ensure protection from water carryover, design with a performance level somewhat below maximum desired pressure drop and .01 oz./sq.ft. of water penetration.

AIR FLOW RESISTANCE

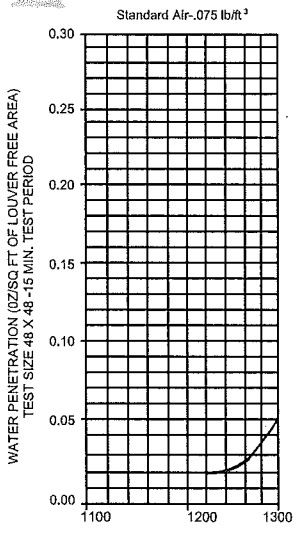


Based on STANDARD AIR- .075 lb. per cubic foot.
Ratings do not include the effects of screen.
Test size 48" x 48"

FREE AREA CHART (SQUARE FEET)

Louver Height	Louver Width In Inches									Louver Height
Inches	12	18	24	30	36	42	48	54	60	Inches
12	0.27	0.44	0.60	0.77	0.94	1.10	1.28	1.45	1.61	12
18	0.47	0.77	1.05	1.35	1.64	1.94	2.24	2.52	2.82	18
24	0.68	1.11	1.53	1.96	2.38	2.81	3.23	3.66	4.08	24
30	0.84	1.37	1.89	2.41	2.94	3.47	3.99	4.51	5.04	30
36	1.03	1.67	2.32	2.96	3.60	4.24	4.89	5.53	6.17	36
42	1.25	2.02	2.81	3.59	4.36	5.14	5.92	6.62	7.47	42
48	1.44	2.34	3.23	4.13	5.02	5.92	6.81	7.71	8.61	48
54	1.63	2.65	3.67	4.69	5.71	6.73	7.74	8.76	9.78	54
60	1.84	2.98	4.12	5.26	6.40	7.55	8.69	9.83	10.97	60
66	2.03	3.29	4.56	5.83	6.55	7.10	9.63	10.90	12.16	66
72	2.24	3.62	5.02	6.41	7.80	9.19	10.58	11.98	13.37	72
78	2.42	3.94	5.44	6.95	8.46	9.97	11.48	12.99	14.50	78
84	2.64	4.59	5.93	7.57	9.22	10.86	12.51	14.17	15.82	84
90	2.84	4.61	6.38	8.14	9.91	11.69	13.45	15.22	16.97	90
96	3.04	4.95	6.84	8.75	10.65	12.31	14.44	16.34	18.24	96

WATER PENETRATION


Standard Air-.075 lb/ft³
WATER PENETRATION (OZ/SQ FT OF LOUVER FREE AREA)
TEST SIZE 48 X 48 -15 MIN. TEST PERIOD
FREE AREA VELOCITY (FT/MIN)

Based on STANDARD AIR- .075 lb. per cubic foot.
Ratings do not include the effects of screen.
15 minute test duration

Beginning point of WATER PENETRATION
is
1217 fpm
the maximum recommended FREE AREA VELOCITY

United Enertech certifies that the AFL-D-4 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA certified rating seal applies to air performance ratings and water penetration ratings.

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

SIEMENS

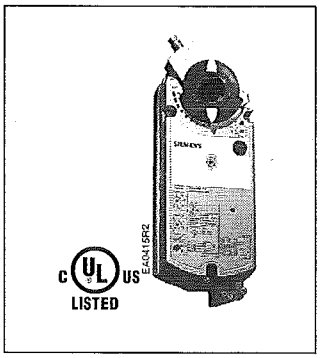
Submittal Sheet
Document No. 154-001P25
September 15, 2003

OpenAir™ GCA Series, 142 lb-in, Spring Return, Direct-Coupled Electronic Damper Actuators

Description

The OpenAir direct-coupled, spring return electronic damper actuators provide modulating, two-position, three-position and electronic tandem control of building HVAC dampers.

Product Number	Operating Voltage			Control				Cables		Built-in Control Options				Electric Tandem Control	
	24 Vac ± 20%	24 Vdc ± 10%	120 Vac ± 10%	0 to 10 Vdc	2 to 10 Vdc	3-position	2-position	Standard	Plenum	Position Feedback	Dual Auxiliary Switches	Signal Inversion	Offset 0 to 5 Vdc Span 2 to 30 Vdc	Master	Slave
GCA121.1U	•	•					•	•							
GCA121.1P	•	•					•		•						
GCA126.1U	•	•					•	•			•				
GCA126.1P	•	•					•		•		•				
GCA221.1U			•				•	•							
GCA226.1U			•				•	•			•				
GCA131.1U	•	•				•		•							
GCA131.1P	•	•				•			•						
GCA132.1P	•	•				•			•	•					
GCA132.1U	•	•				•		•		•					
GCA136.1P	•	•				•			•		•				
GCA136.1U	•	•				•		•			•				
GCA151.1U	•	•			•			•		•		•			
GCA151.1P	•	•			•				•	•		•			
GCA156.1U	•	•			•			•		•	•	•			
GCA156.1P	•	•			•				•	•	•	•			
GCA161.1U	•			•				•		•					
GCA161.1P	•			•					•	•					
GCA163.1U	•			•				•		•			•		
GCA163.1P	•			•					•	•			•		
GCA164.1U	•			•				•		•	•		•		
GCA164.1P	•			•					•	•	•		•		
GCA166.1U	•			•				•		•	•				
GCA166.1P	•			•					•	•	•				
GCA161.1P/MAS	•			•					•	•				•	
GCA164.1P/MAS	•			•					•	•	•		•	•	
GCA161.1P/SLA	•								•						•



Features

- Brushless DC motor technology with stall protection
- Bi-directional fail-safe spring return
- Unique self-centering shaft coupling
- Models available with dual independently adjustable auxiliary switches
- All modulating models offer built-in feedback
- Floating control models available with feedback potentiometer
- All metal housing
- Manual override
- 5° preload as shipped from factory
- Mechanical range adjustment capability by moving shaft coupling to desired position
- Easily visible position indicator
- Precabled
- UL60730 and cUL (C22.2 No. 24-93) listed

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

Technical Data

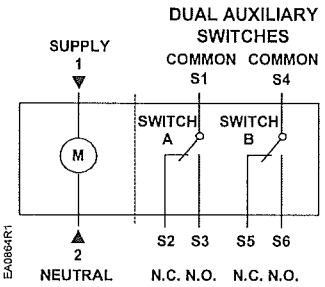
24 Vac, 120 Vac Torque:	142 lb-in (16 Nm) running and spring return <360 lb-in (40 Nm) maximum
GCA12x, GCA13x, GCA15x Only:	
24 Vdc Torque	106 lb-in (12 Nm) running and spring return
Runtime for 90°:	90 sec. operating, 15 sec. typical (30 sec. max.) closing on power loss
Frequency:	50/60 Hz
Power consumption: Running:	8 VA/6W (24Vac; GCA12x, GCA13x) 9 VA/7W (24V, GCA15x) 9 VA (24Vac GCA16x) 9 VA (120 Vac GCA22x)
Power consumption: Holding	3 VA/3W (24V, GCA12x) 5 VA/4W (24V, GCA13x, GCA15x) 5 VA (24Vac, GCA16x) 9 VA (120 Vac, GCA22x)
Equipment rating (24V):	Class 2 per UL/CSA
Noise level:	<45 dBA (running)
Angle of rotation:	90° nominal, 95° max.
Shaft dimensions:	3/8-in to 1-in (8 to 25,6 mm) dia. 1/4-in to 3/4-in (6 to 18 mm) sq. 3/4-in (20 mm) min. length
Operating temperature:	-25°F to 130°F (-32°C to 55°C)
Storage temperature:	-40°F to 158°F (-40°C to 70°C)
Ambient humidity:	95% rh (non-condensing)
Pre-cabled connection:	18 AWG, 3 ft (0,9 m) long
Enclosure:	NEMA 2, IP40 per EN60529
Material:	Die cast aluminum alloy
Agency listings:	UL60730, cUL C22.2 No. 24-93
Gear Lubrication:	Silicone-free
Weight:	4.85 lb (2.2 kg)
Dimensions:	11-13/16 in (300 mm) H 4-3/4 in (120 mm) W 2-7/8 in (72 mm) D

Typical Specifications

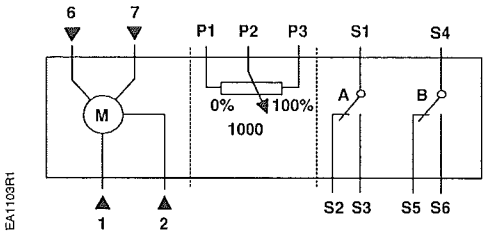
Spring-return damper actuators shall be the direct-coupled type that requires no connecting linkages. The spring return actuators shall have a self-centering damper shaft coupling that assures concentric alignment of the actuator's output coupling with the damper shaft and be capable of direct mounting to a shaft up to a 1-inch diameter. Actuators shall use a brushless DC motor and provide stall protection throughout the full range of rotation. All spring return actuators shall be capable of both clockwise and counterclockwise spring return fail-safe operation using a continuously engaged mechanical return spring that returns the actuator to a fail-safe position in <20 seconds in response to a loss of power. All actuators shall provide a means of manually positioning the output coupling in the absence of power. Dual independently adjustable auxiliary switches must be integral to the actuator. All actuators must be precabled and provide an easily readable high contrast yellow on black position indicator. All actuators shall be UL60730 and CSA22.2 listed and manufactured under ISO 9002 and ISO 14000 procedures. Actuators shall be designed for a minimum of 50,000 full stroke cycles at the actuators rated torque and temperatures. Actuators shall be as manufactured by Siemens Building Technologies.

Wiring Diagrams

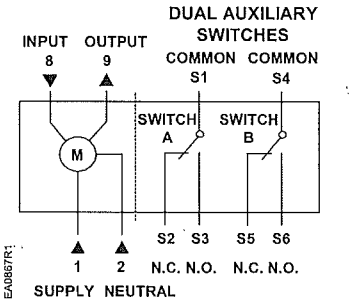
2-Position, 24 Vac/dc:



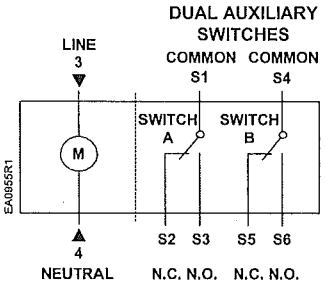
3-Position, 24 Vac/dc:



0 to 10 Vdc, GCA16x, 24 Vac;
2 to 10 Vdc, GCA15x, 24 Vac/dc:



2-Position, 120 Vac:



Information in this publication is based on current specifications. The company reserves the right to make changes as design improvements are introduced.
OpenAir is a trademark of Siemens Building Technologies, Inc Other product or company names mentioned herein may be the trademarks of their respective owners.
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HVAC Submittal Cover Sheet

SECTION: 9
PRODUCT: Gas-Fired Unit Heater

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Sterling
SUPPLIER:	GAA
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

GEORGIA AIR ASSOCIATES

SUBMITTAL

PRODUCT: GAS-FIRED UNIT HEATER PAGE: 1 OF 1

MANUFACTURER: STERLING FILE:

SPEC. PARA. NO.: MECH. DWGS. DATE: 5/20/15

PROJECT: MEDLINE WILDCAT II - LINES 7 & 8 ARCH: WAKEFIELD BEASLEY & ASSOCIATES

LOCATION: LITHIA SPRINGS, GA ENGR: AHA CONSULTING ENGINEERS

REMARKS: CUST: PAULSON-CHEEK MECHANICAL

TAG:	QTY:	MODEL:	CFM:	MBH IN:	MBH OUT:	ACCESSORIES:
UH-1	1	TF-250-N	3450	250	207.5	---

NOTE: THERMOSTATS, GAS PRESSURE REGULATORS, VENT CAPS AND PIPING ARE TO BE PROVIDED BY OTHERS.

Z6

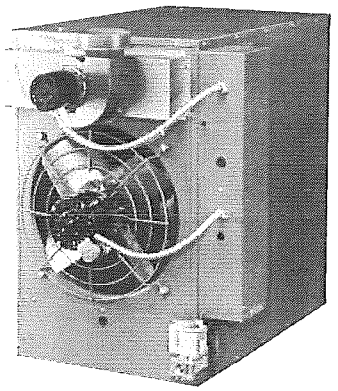
STERLING MODEL "TF" TUBULAR DESIGN GAS FIRED UNIT HEATER

ENERGY PERFORMANCE VERIFIED
RENDEMENT ENERGETIQUE VERIFIE

TFS-6

DESCRIPTION

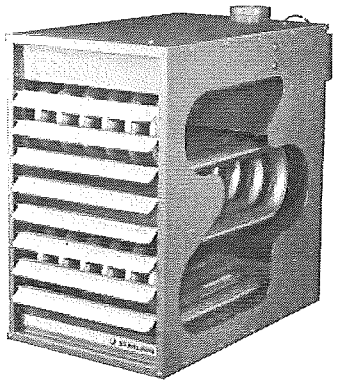
The Sterling Model "TF" gas-fired unit heater offers a highly efficient, extremely durable alternative to the traditional clam shell design. These propeller type units combine the latest tubular heat exchanger and inshot burner technology with the quality and reliability you have come to know from Sterling. Units are available in sizes 150 to 400 MBH.



Standard energy saving features like the direct spark ignition and power venting reduce standby losses and offer improved seasonal efficiencies. The Model "TF" unit is certified by ETL as providing 83% thermal (combustion) efficiency.

TUBULAR HEAT EXCHANGER

The Sterling tubular heat exchanger has been designed to provide maximum and uniform heat transfer. The low pressure drop associated with this design enables heated air to be evenly distributed to the conditioned space. This curved, non-welded serpentine design experiences less thermally induced stress making it highly durable for significantly longer service life. All Sterling tubular heat exchangers are constructed of heavy duty 20-gauge aluminized steel. Optional 409 stainless steel heat exchangers are also available.



DIRECT SPARK IGNITION SYSTEM

Sterling Model "TF" units utilize a direct spark pilotless ignition of the burner, providing fast heat delivery. This highly reliable and efficient ignition system incorporates an integrated electronic control board to regulate the system sequence of operation, including an onboard LED indicator for simple troubleshooting.

VENTING

The Sterling Model "TF" unit heater is ETL certified in accordance with categories I and III venting requirements. This certification allows units to be vented both vertically and horizontally using either single wall or double wall venting materials. This venting flexibility of the Model "TF" unit heater makes installation easier and more cost effective by allowing the installer to utilize existing venting components.

CONTROL ACCESSIBILITY

Designed with the service person in mind, every component of the Sterling Model "TF" is easily accessible. Ignition and fan controls are located in one centrally located control panel. The access door provides control isolation as well as a pleasing exterior appearance.

STANDARD FEATURES

- Inshot burner design
- 20-gauge steel jacket with baked enamel finish.
- Main control panel
- 120/1/60 supply voltage
- Power vented
- 120/24 volt control transformer
- Direct Spark Ignition
- Individually adjustable and removable louvers
- Single stage combination gas valve
- 115/1/60 volt fan motor with internal overload protection
- 10 year heat exchanger, flue collector and burner warranty.

Project: Medline Wildcat II – Lines 7 & 8
Location: Lithia Springs, GA
Mech. Contractor: Paulson-Cheek Mechanical
Mech. Engineer: AHA Consulting Engineers
Submitted by: Georgia Air Associates

STERLING®
HVAC PRODUCTS
260 North Elm St., Westfield, MA 01085
(413) 564-5540 Fax: (413) 562-5311
www.sterlinghvac.com

03/09

TF TUBULAR DESIGN
PERFORMANCE AND DIMENSIONAL DATA

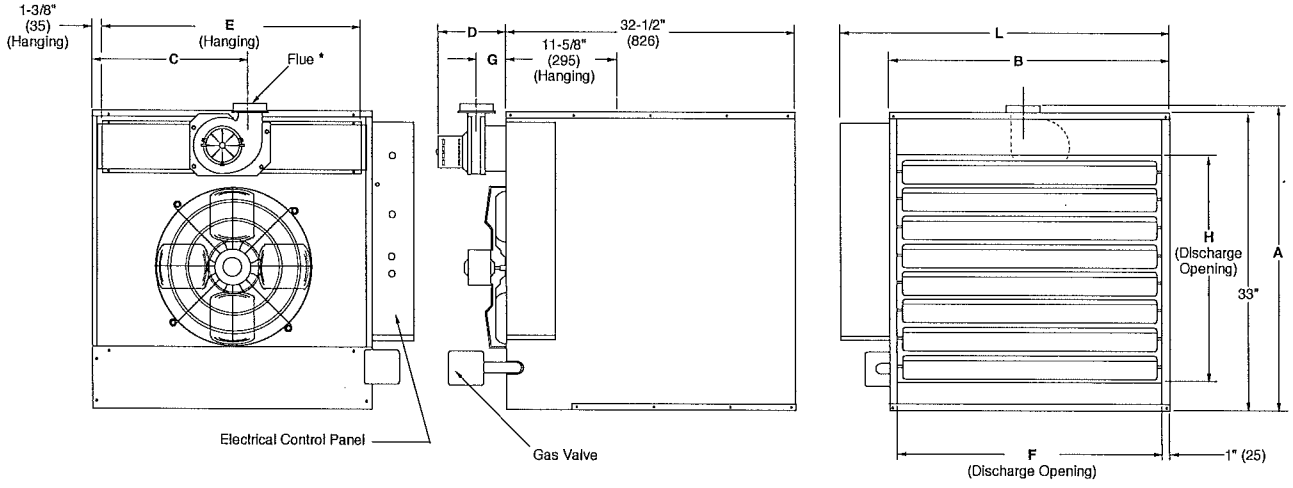
ENERGY PERFORMANCE VERIFIED
RENDEMENT ENERGETIQUE VERIFIE

Model TF Unit Size	150	175	200	250	300	350	400
PERFORMANCE DATA†							
Input - BTU/Hr.	150,000	175,000	200,000	250,000	300,000	350,000	400,000
(kW)	(43.9)	(51.2)	(58.6)	(73.2)	(87.8)	(102.5)	(117.1)
Output - BTU/Hr.	124,500	145,250	166,000	207,500	249,000	290,500	332,000
(kW)	(36.4)	(42.5)	(48.6)	(60.7)	(72.9)	(85.1)	(97.2)
Thermal Efficiency (%)	83	83	83	83	83	83	83
Free Air Delivery - CFM	2,400	2,850	3,200	3,450	5,000	5,600	5,800
(cu. m/s)	(1.133)	(1.346)	(1.511)	(1.629)	(2.361)	(2.644)	(2.738)
Air Temperature Rise - Deg. F	47	46	47	54	45	47	51
(Deg. C)	(26)	(26)	(26)	(30)	(24)	(26)	(28)
Full Load Amps at 120V	5.8	8.0	8.0	8.0	11.3	13.5	13.5
MOTOR DATA: Motor HP (Qty.)	1/4	1/3	1/3	1/3	(2) 1/4	(2) 1/3	(2) 1/3
Motor kW	(0.19)	(0.25)	(0.25)	(0.25)	(0.19)	(0.25)	(0.25)
Motor Type	PSC	PSC	PSC	PSC	PSC	PSC	PSC
R.P.M.	1,140	1,140	1,140	1,140	1,140	1,140	1,140
Amps @ 115V	4.7	5.8	5.8	5.8	9.4	11.6	11.6
DIMENSIONAL DATA - inches (mm)							
"A" Overall Height to Top of Flue	33-3/4	33-3/4	33-3/4	33-3/4	34	34	34
	(857)	(857)	(857)	(857)	(864)	(864)	(864)
"B" Jacket Width of Unit	20-3/4	32-3/4	32-3/4	32-3/4	50-3/4	50-3/4	50-3/4
	(527)	(831)	(831)	(831)	(1289)	(1289)	(1289)
"C" Width to Centerline Flue	13-3/8	19-3/8	19-3/8	19-3/8	28-3/8	28-3/8	28-3/8
	(340)	(492)	(492)	(492)	(721)	(721)	(721)
"D" Depth to Rear of Housing	11	11	11	11	12-1/4	12-1/4	12-1/4
	(279)	(279)	(279)	(279)	(311)	(311)	(311)
"E" Hanging Distance Width	18-5/8	30-5/8	30-5/8	30-5/8	48-5/8	48-5/8	48-5/8
	(473)	(778)	(778)	(778)	(1235)	(1235)	(1235)
"F" Discharge Opening Width	18-3/4	30-3/4	30-3/4	30-3/4	48-3/4	48-3/4	48-3/4
	(476)	(781)	(781)	(781)	(1238)	(1238)	(1238)
"G" Depth to Centerline Flue	4-3/4	4-3/4	4-3/4	4-3/4	5-1/8	5-1/8	5-1/8
	(121)	(121)	(121)	(121)	(130)	(130)	(130)
"H" Discharge Opening Height	24-1/2	24-1/2	24-1/2	24-1/2	24-1/2	24-1/2	24-1/2
	(622)	(622)	(622)	(622)	(622)	(622)	(622)
"L" Overall Unit Width	25-1/4	37-1/4	37-1/4	37-1/4	55-1/4	55-1/4	55-1/4
	(641)	(946)	(946)	(946)	(1403)	(1403)	(1403)
*Flue Size Diameter - in.	5	5	5	5	6	6	6
(Dia.-mm)	(127)	(127)	(127)	(127)	(152)	(152)	(152)
Fan Diameter - in. (Qty.)	16	18	18	18	(2) 16	(2) 18	(2) 18
Gas Inlet-Natural Gas (in.)	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Gas Inlet- LP Gas (in.)	1/2	1/2	1/2	1/2 OR 3/4	1/2 OR 3/4	1/2 OR 3/4	1/2 OR 3/4
Approximate Unit Weight - lbs.	155	191	201	211	307	321	335
(kg)	(70)	(87)	(91)	(96)	(139)	(145)	(152)
Approximate Ship Weight - lbs.	195	241	251	261	367	381	395
(kg)	(88)	(109)	(114)	(118)	(166)	(173)	(179)

† Ratings shown are for unit installations at elevations between 0 and 2,000 ft (0 to 610m). For unit installations in U.S.A. above 2,000 ft. (610m), the unit input must be derated 4% for each 1,000 ft. (305m) above sea level; refer to local codes, or in absence of local codes, refer to the latest edition of the National Fuel Gas Code, ANSI Standard Z223.1 (N.F.P.A. No. 54).

For installations in Canada, any reference to deration at altitudes in excess of 2,000 ft. (610m) are to be ignored. At altitudes of 2,000 ft. to 4,500 ft. (610 to 1372m), the unit must be derated to 90% of the normal altitude rating, and be so marked in accordance with the ETL certification.

* Flue collar is factory supplied with unit; to be field installed per included instructions.



D4617

Rear View **Side View** **Front View**

DIMENSIONS .XXX STANDARD UNITS
DIMENSIONS IN PARENTHESIS (XXX) MILLIMETERS

HVAC Submittal Cover Sheet

SECTION: 10
PRODUCT: Desiccant Dryers

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	05/21/15
MANUFACTURER:	Ingersoll Rand
SUPPLIER:	Ingersoll Rand
SUBMITTED DATE:	05/21/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	05/21/15

Presented To:

- Carden Clark
  Paulson-Cheek Mechanical
  6145 Northbelt Parkway, Suite F
  Norcross, GA 30071

Project:

Compressed Air System Submittal
Medline Industries, Inc.
Lithia Springs Manufacturing Site

Prepared By:

- Christopher George
  cgeorge@irco.com
  6135-E Northbelt Drive
  Norcross, GA 30071
  Direct: (770) 903-4612
  Fax: (866) 495-2711
  Cell Phone: (404) 217-1410

Prepared On: 5/21/2015

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HL1500 Desiccant Dryer	13
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Equipment List

Product Description	Qty
R225ne (300 HP) Variable Speed Rotary Screw Air Compressor	2
• 460 Volt Hybrid Permanent Magnet Motor	
• Line Reactor (shipped loose)	
• Xe Series Controller	
• Air Cooled After Cooler	
• Electronic No Loss Drain Valve	
• Sound Attenuating Enclosure	
HL1500 Desiccant Dryer	2
• High Efficiency Coalescing Pre-Filter	
• General Particulate Post-Filter	
• PNLD II - 28 Pneumatic No Loss Drain Valve	

Heatless Desiccant Dryer
HL1500

Image for reference only

Technical Information:

Capacity: 1500 scfm

Dew Point: -40°F

Maximum Operating Pressure: 150 psig

Weight*: 2974 lbs.

Connection Size: 4" FLG

Desiccant weight per vessel: 800 lbs.

Dimensions (W x D x H)*: 78" x 55" x 80"

**Dimensions and shipping weight for dryer only – filters are shipped loose*

Additional Engineering Data available upon request

Product Description:

The HL Heatless Desiccant Dryers provide constant -40˚F /-40˚C pressure dew point (optional -100˚F / -70˚C) to ensure that clean, dry air is delivered to the customer's point of usage. These dryers include pre-filters and after-filters to keep the air stream clean and maintain the integrity of the desiccant medium. A digital controller and NEMA 4 electrics complete the premium characteristics of these dryers.

By using system air to purge the desiccant beds, HL Heatless Dryers and their filters remove contaminants that could spoil the customer's product or manufacturing processes while conserving electrical energy associated with heat regenerative dryers. The switching valves and electrical control design provide increased reliability and reduced maintenance while affording safe and simple operation.

Key Features & Benefits:

- Pre-filter and After-filter
- High Performance Valves
- Micro Processor Controller
- MODBUS Compatible
- SS Desiccant Screens
- Low Profile Design

Visit the Ingersoll Rand website for further information http://www.ingersollrandproducts.com

All specifications are given for informational purposes only. All information is subject to change without notice.
The attached terms and conditions are an integral part of this quotation and any resulting orders.

HL DESICCANT DRYER
HL 90 - HL5000

Industrial Technologies
Davidson, NC 28036

DATE: 8-Aug-12
CANCELS: All Previous

ENGINEERING DATA - 60 HZ

	HL90	HL120	HL160	HL200	HL250	HL300
-40 F Inlet Capacity (scfm)	90	120	160	200	250	300
-100 F Inlet Capacity (scfm)	72	96	128	160	200	240
Purge (SCFM)	13	18	24	29	37	44
Desiccant per Tower (lbs)	50	67	96	118	145	172
Tower Diameter (inches)	8	8	10	10	12	12
Electrical	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
MCA / MOP (amps)	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5
Air In/Out Connections (inches)	1" NPT	1" NPT	1½" NPT	1½" NPT	1½" NPT	2" NPT
Width (inches)[1]	40.5	40.5	44.5	44.5	48.5	48.5
Depth (inches)[1]	30	30	32	32	32	32
Height (inches)[1]	63.1	63.1	66.1	66.1	66.8	66.8
Shipping Weight (lbs)[1]	475	563	707	731	869	924

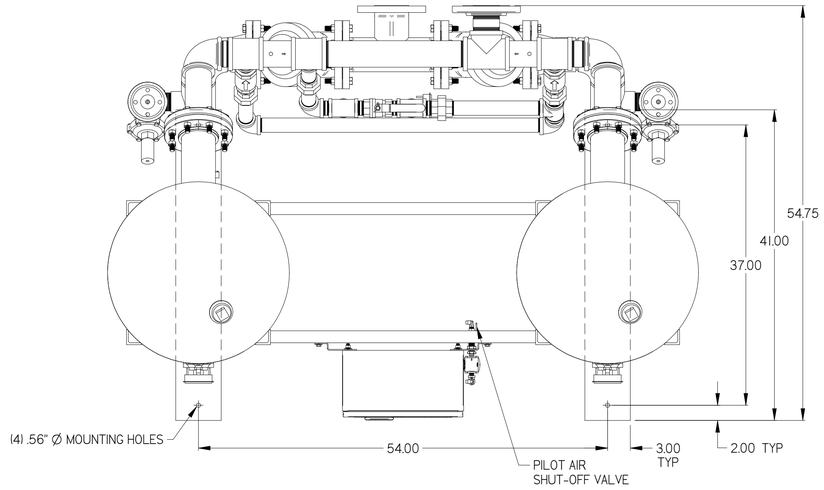
	HL400	HL500	HL600	HL800	HL1000	HL1200
-40 F Inlet Capacity (scfm)	400	500	600	800	1000	1200
-100 F Inlet Capacity (scfm)	320	400	480	640	800	960
Purge (SCFM	59	74	88	118	147	177
Desiccant per Tower (lbs)	235	319	374	450	550	635
Tower Diameter (inches)	14	16	16	20	20	20
Electrical	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
MCA / MOP (amps)	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5
Air In/Out Connections (inches)	2" NPT	2" NPT	2" NPT	3"NPT	3"NPT	3"NPT
Width (inches)[1]	52.5	56.5	56.5	64	64	64
Depth (inches)[1]	36.2	39.7	42.4	51.3	51.3	51.3
Height (inches)[1]	67.8	82.5	82.5	87.6	87.6	87.6
Shipping Weight (lbs)[1]	1115	1564	1664	2017	2237	2424

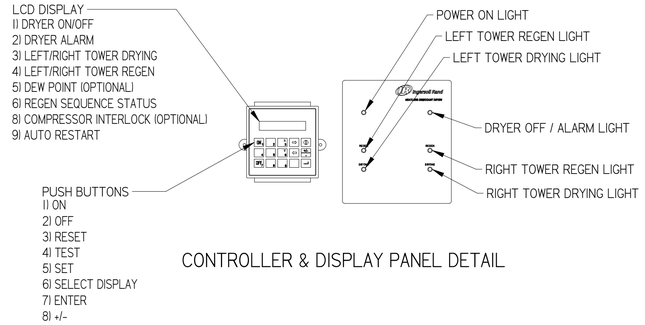
	HL1500	HL1800	HL2100	HL2700	HL3300	HL4000	HL5000
-40 F Inlet Capacity (scfm)	1500	1800	2100	2700	3300	4000	5000
-100 F Inlet Capacity (scfm)	1200	1440	1680	2160	2640	3200	4000
Purge (SCFM	221	265	310	398	486	590	737
Desiccant per Tower (lbs)	800	1000	1170	1464	2000	2125	2800
Tower Diameter (inches)	24	30	30	30	36	36	42
Electrical	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
MCA / MOP (amps)	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5	4 / 5
Air In/Out Connections (inches)	4" FLG	4" FLG	4" FLG	4" FLG	6" FLG	6" FLG	6" FLG
Width (inches)[1]	78	84	84	84	96	96	102
Depth (inches)[1]	54.8	60.6	60.6	60.8	66	66	72
Height (inches)[1]	80	91.9	91.9	91.9	100	100	92
Shipping Weight (lbs)[1]	2974	3905	4279	4926	2950	3000	3950

[1]Dimensions and Shipping Weight on HL1500 and larger are for the dryer only (filters ship loose). HL3300 and larger shipping weight does not include desiccant (shipped loose)

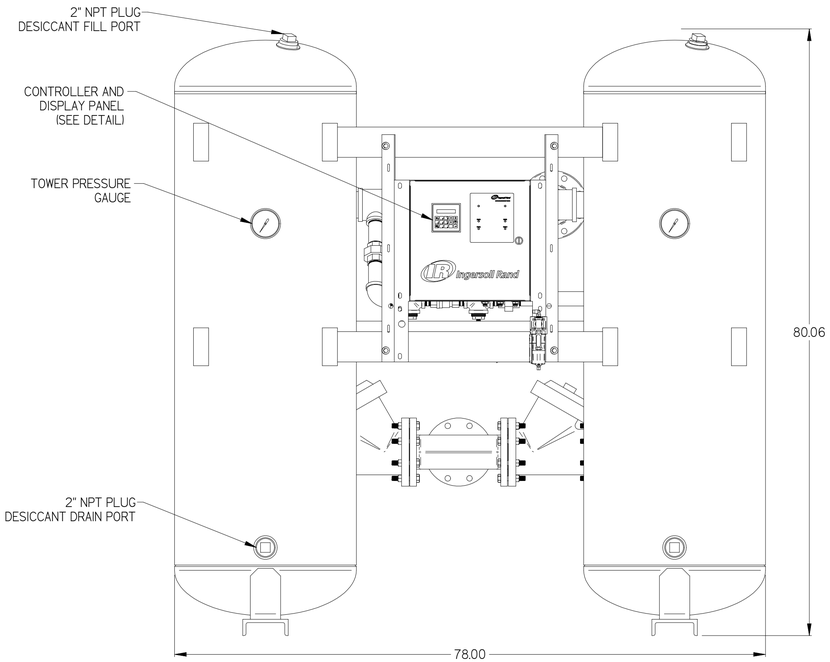
Capacity on all models is based on 100 F, 100 psig.
Maximum allowable inlet temperature is 120 F.
Maximum inlet pressure is 150 psig.
Safety valve setting is 165 psig.
NEMA cycle time for -40 F is 10 min. / 5 min. each vessel.
NEMA cycle time for -100 F is 4 min. / 2 min. each vessel.

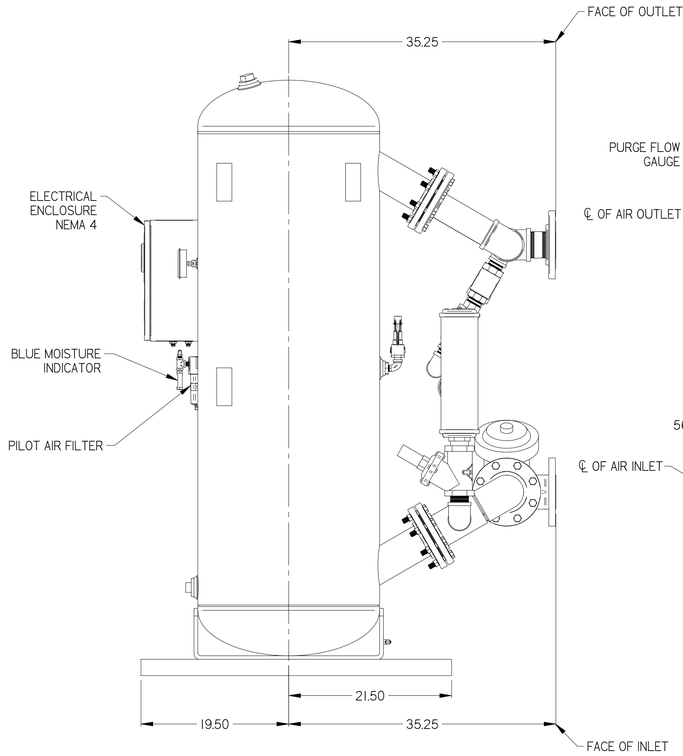
REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DWN	APPVD
	A		REDESIGNED UPPER MANIFOLD	1/04/07		
	B	6413	DOWNSTREAM PURGE REORIENTATION	03/08/07	SAJ	DG
	C	6464	CHANGED DH FILTERS TO NEW DH ELIMINATOR STYLE	06/16/08	BSA	DG
	D	6530	UPDATED CONTROLLER VIEWS	11/18/09	JFF	
	E	6530	UPDATED OVERLAY VIEWS	05/22/12	JFF	
	F	6615	REPLACED ENCLOSRE & FTR PER ECO	07/18/12	BSA	

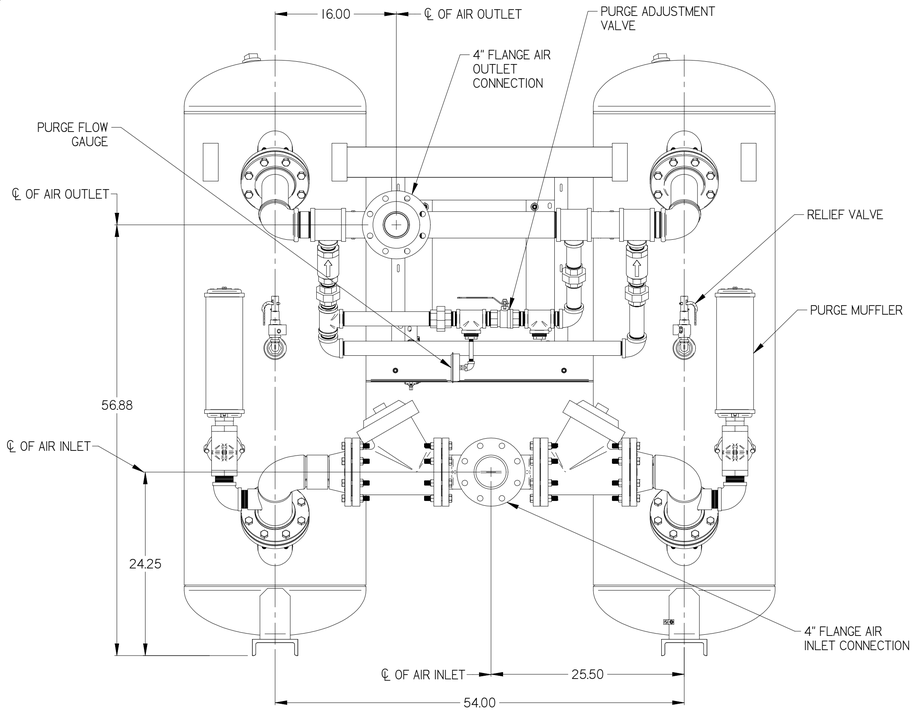




CONTROLLER & DISPLAY PANEL DETAIL







NOTES:
1) MAXIMUM WORKING PRESSURE - 150 P.S.I.
2) SAFETY RELIEF VALVE SETTING - 165 P.S.I
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE'S LATEST EDITION.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES, TOLERANCES ARE:
FRACTIONS ± X/XX | DECIMALS ± .50, ± X.XXX | ANGLE ± X.X°

DO NOT SCALE

PROPRIETARY NOTICE

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NOUN CODE

THIRD ANGLE PROJECTION

DRAWN	SAJ
DATE	11/7/06
CHECKED	
APPROVED	CFW
DATE	11/7/06

Ingersoll Rand

TITLE: GENERAL ARRANGEMENT HL 1500

SIZE	ESTIMATED WEIGHT	DRAWING NO.	REVISION
B		580006	F

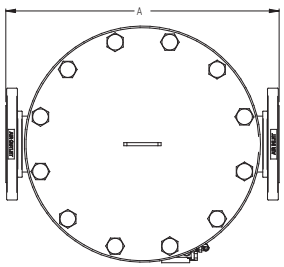
SCALE: NONE | UNIT: | SHEET 1 OF 1

6/18/2015

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DWN	APPVD
	A		INFORMATION TABLE UPDATED	06/18/08	BSA	DMG
	B		UPDATE PER IR SALES COMMENTS	10/28/08	MDJ	
	C		SIDE VIEW ADDED	11/24/08	BSA	TL
	D	6540	SEPARATED MODEL EH 3000 AND HB 3000	09/29/09	SAJ	DMG
	E		ADDED HL MODELS DUE TO FILTER CHANGE	11/17/09	SAJ	DMG
	F	6548	ADDED TOLERANCE AND ADDED HL, EH & HB DESIGNATIONS TO DATA TABLES	01/12/10	SAJ	DMG
	G	6561	UPDATED FLOW DIRECTIONS PER ECO	07/05/10	BSA	DMG

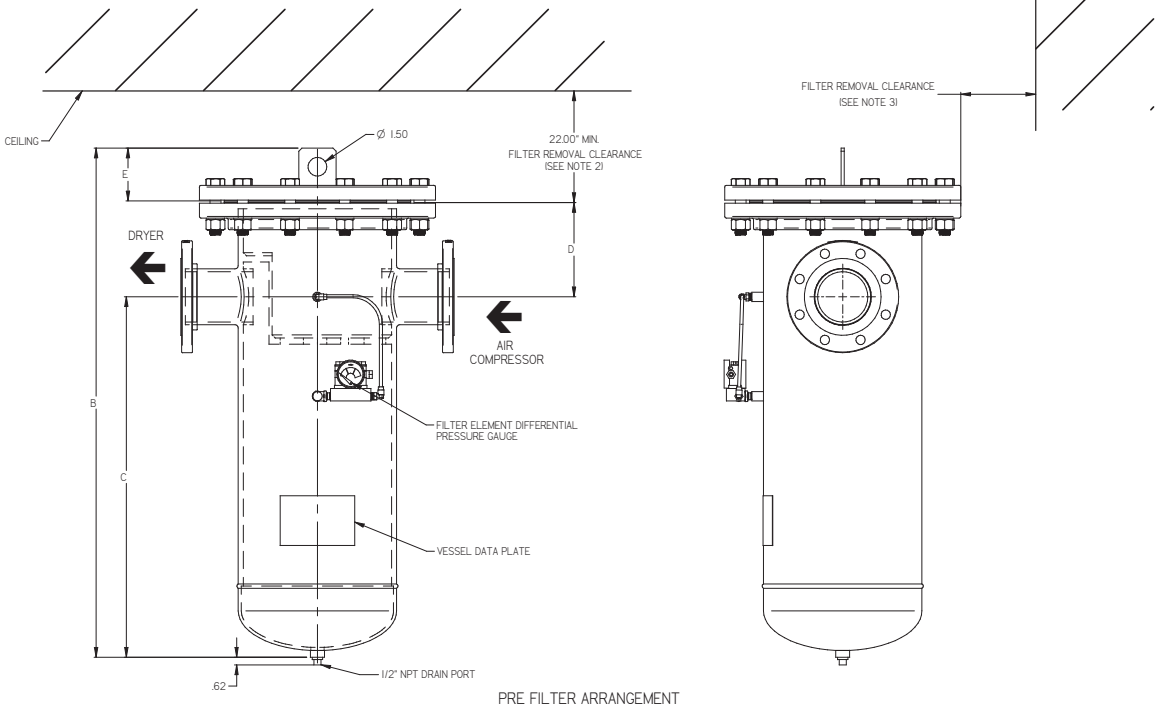
FIELD INSTALLATION ORIENTATION
(VIEWED FROM GAUGE SIDE)

PREFILTER FLOW



NOTES;

1- MAXIMUM WORKING PRESSURE 150 PSI
2- MINIMUM CLEARANCE DIMENSION OF 22.00" ABOVE VESSEL HOUSING IS REQUIRED FOR SERVICING ELEMENTS. ADDITIONAL CLEARANCE MAYBE NECESSARY FOR LIFTING DEVICE.
3- SUFFICENT CLEARANCE MUST BE PROVIDED AROUND VESSEL TO ALLOW FOR ELEMENT REPLACEMENT AND CLEARANCE FOR LIFTING DEVICE TO REMOVE BLIND FLANGE.
4- AUTOMATIC DRAIN SHOULD BE INSTALLED ON PREFILTERS TO INSURE PROPER OPERATION.



PRE FILTER ARRANGEMENT

HL, ~~EH & HB~~ PREFILTER DATA

DRYER MODEL	FILTER MODEL	FILTER SCFM	INLET / OUTLET SIZE (150# FLANGE)	DIMENSIONS (INCH/MM) A	B	C	D	E	DRAIN (NPT)	WEIGHT (LBS/KG)	PREFILTER ASSEMBLY (CCN)	PREFILTER ELEMENT (CCN)	ELEMENT QTY.
HL 1500	F3000IH	1800	4"	19.00 482.60	38.31 973.07	27.06 687.32	7.44 188.72	4.19 106.40	1/2"	168 76.20	38446589	38446357	3
~~EH/HB/HL 1800~~	~~F3000IH~~	~~1800~~	~~4"~~	~~19.00 482.60~~	~~38.31 973.07~~	~~27.06 687.32~~	~~7.44 188.72~~	~~4.19 106.40~~	~~1/2"~~	~~168 76.20~~	38446589	38446357	~~3~~
~~EH/HB/HL 2100~~	~~F4000IH~~	~~2400~~	~~4"~~	~~19.00 482.60~~	~~38.31 973.07~~	~~27.06 687.32~~	~~7.44 188.72~~	~~4.19 188.72~~	~~1/2"~~	~~170 77.11~~	38446597	38446357	~~4~~
~~HL 2700~~	~~F5000IH~~	~~3000~~	~~4"~~	~~22.00 558.80~~	~~39.50 1003.30~~	~~27.56 700.02~~	~~7.69 195.07~~	~~4.25 108.00~~	~~1/2"~~	~~208 94.35~~	38446605	38446357	~~5~~
~~EH 3000~~	~~F5000IH~~	~~3000~~	~~4"~~	~~22.00 558.80~~	~~39.50 1003.30~~	~~27.56 700.02~~	~~7.69 195.07~~	~~4.25 108.00~~	~~1/2"~~	~~208 94.35~~	38446605	38446357	~~5~~
~~HB 3000~~	~~F6100H~~	~~3600~~	~~6"~~	~~27.50 698.50~~	~~42.31 1074.67~~	~~28.88 733.30~~	~~9.00 228.60~~	~~4.44 112.70~~	~~1/2"~~	~~316 143.34~~	23536428	38446357	~~6~~
~~HL 3300~~	~~F6100H~~	~~3600~~	~~6"~~	~~27.50 698.50~~	~~42.31 1074.67~~	~~28.88 733.30~~	~~9.00 228.60~~	~~4.44 112.70~~	~~1/2"~~	~~316 143.34~~	23536428	38446357	~~6~~
~~EH/HB/HL 4000~~	~~F7100IH~~	~~4200~~	~~6"~~	~~27.50 698.50~~	~~42.31 1074.67~~	~~28.88 733.30~~	~~9.00 228.60~~	~~4.44 112.70~~	~~1/2"~~	~~318 144.24~~	38446613	38446357	~~7~~
~~EH/HB/HL 5000~~	~~F10100IH~~	~~6000~~	~~6"~~	~~27.50 698.50~~	~~42.31 1074.67~~	~~28.88 733.30~~	~~9.00 228.60~~	~~4.44 112.70~~	~~1/2"~~	~~324 146.96~~	38446621	38446357	~~10~~
~~EH/HB 6000~~	~~F10100IH~~	~~6000~~	~~6"~~	~~27.50 698.50~~	~~42.31 1074.67~~	~~28.88 733.30~~	~~9.00 228.60~~	~~4.44 112.70~~	~~1/2"~~	~~324 146.96~~	38446621	38446357	~~10~~
~~EH/HB 8000~~	~~F15200IH~~	~~9000~~	~~8"~~	~~39.00 990.60~~	~~48.00 1219.20~~	~~35.19 893.57~~	~~11.00 279.40~~	~~4.88 123.80~~	~~1/2"~~	~~585 265.80~~	38446639	38446357	~~15~~

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THIRD ANGLE PROJECTION

DRAWN	SAJ	02/24/07
CHECKED		
APPROVED	DG	02/24/07

Ingersoll Rand

TITLE: GENERAL ARRANGEMENT
PREFILTER & AFTERFILTER
~~EH & HB 1800 - 8000 SCFM &~~ HL 1500 - ~~5000~~ SCFM

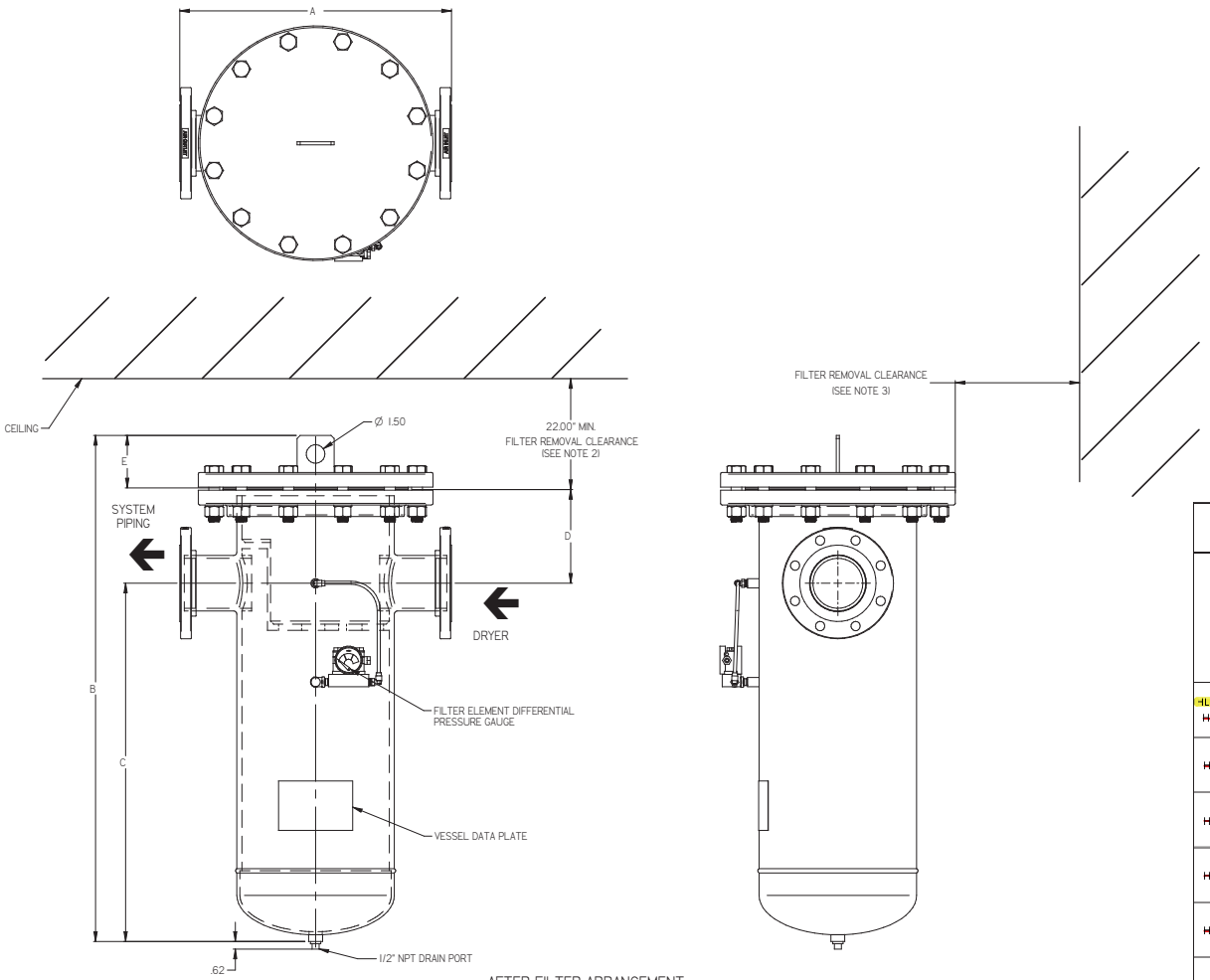
SIZE	ESTIMATED WEIGHT	DRAWING NO.	REVISION
B		580086	G

SCALE NONE UNIT SHEET 1 OF 3

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DWN	APPVD
	A		INFORMATION TABLE UPDATED	08/18/08	BSA	DMG
	B		UPDATE PER IR SALES COMMENTS	10/28/08	MDJ	
	C		SIDE VIEW ADDED	11/24/08	BSA	TL
	D	6540	SEPARATED MODEL EH 3000 AND HB 3000	09/29/09	SAJ	DMG
	E		ADDED HL MODELS DUE TO FILTER CHANGE	11/17/09	SAJ	DMG
	F	6548	ADDED TOLERANCE AND ADDED HL, EH & HB DESIGNATIONS TO DATA TABLES	01/12/10	SAJ	DMG
	G	6561	UPDATED FLOW DIRECTIONS PER ECO	07/05/10	BSA	DMG

FIELD INSTALLATION ORIENTATION
(VIEWED FROM GAUGE SIDE)

AFTERFILTER FLOW



AFTER FILTER ARRANGEMENT

NOTES;

1- MAXIMUM WORKING PRESSURE 150 PSI
2- MINIMUM CLEARANCE DIMENSION OF 22.00" ABOVE VESSEL HOUSING IS REQUIRED FOR SERVICING ELEMENTS. ADDITIONAL CLEARANCE MAYBE NECESSARY FOR LIFTING DEVICE.
3- SUFFICENT CLEARANCE MUST BE PROVIDED AROUND VESSEL TO ALLOW FOR ELEMENT REPLACEMENT AND CLEARANCE FOR LIFTING DEVICE TO REMOVE BLIND FLANGE.

HL AFTERFILTER DATA

DRYER MODEL	FILTER MODEL	FILTER SCFM	INLET / OUTLET SIZE (150# FLANGE)	DIMENSIONS (INCH/MM)					DRAIN (NPT)	WEIGHT (LBS/KG)	FILTER ASSEMBLY CCN	FILTER ELEMENT	ELEMENT QTY.	ELEMENT MICRON
~~HL1500 & HL1800~~	~~F3000IG~~	~~1800~~		19.00 482.60	38.31 973.07	27.06 687.32	7.44 188.72	4.19 106.40		~~168~~ ~~76,20~~	23552953	23553357	~~3~~	~~1~~
~~HL2100~~	~~F4000IG~~	~~2400~~	~~4"~~							~~170~~ ~~77,11~~	23552961	23553357	~~4~~	~~1~~
~~HL2700~~	~~F5000IG~~	~~3000~~		~~22.00~~ ~~558.80~~	~~42.31~~ ~~1074.67~~	~~28.88~~ ~~733.30~~	~~9.00~~ ~~228.60~~	~~4.19~~ ~~106.40~~		~~208~~ ~~94,35~~	23553019	23553357	~~5~~	~~1~~
~~HL3300~~	~~F6100IG~~	~~3600~~							~~1/2"~~	~~316~~ ~~143,34~~	23553027	23553357	~~6~~	~~1~~
~~HL4000~~	~~F7100IG~~	~~4200~~	~~6"~~	~~27.50~~ ~~698.50~~	~~42.31~~ ~~1074.67~~	~~28.88~~ ~~733.30~~	~~9.00~~ ~~228.60~~	~~4.19~~ ~~106.40~~		~~318~~ ~~144,24~~	23553076	23553357	~~7~~	~~1~~
~~HL5000~~	~~F10100IG~~	~~6000~~								~~324~~ ~~146,96~~	23553183	23553357	~~10~~	~~1~~

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DRAWN	SAJ	02/24/07
CHECKED		
APPROVED	DG	02/24/07

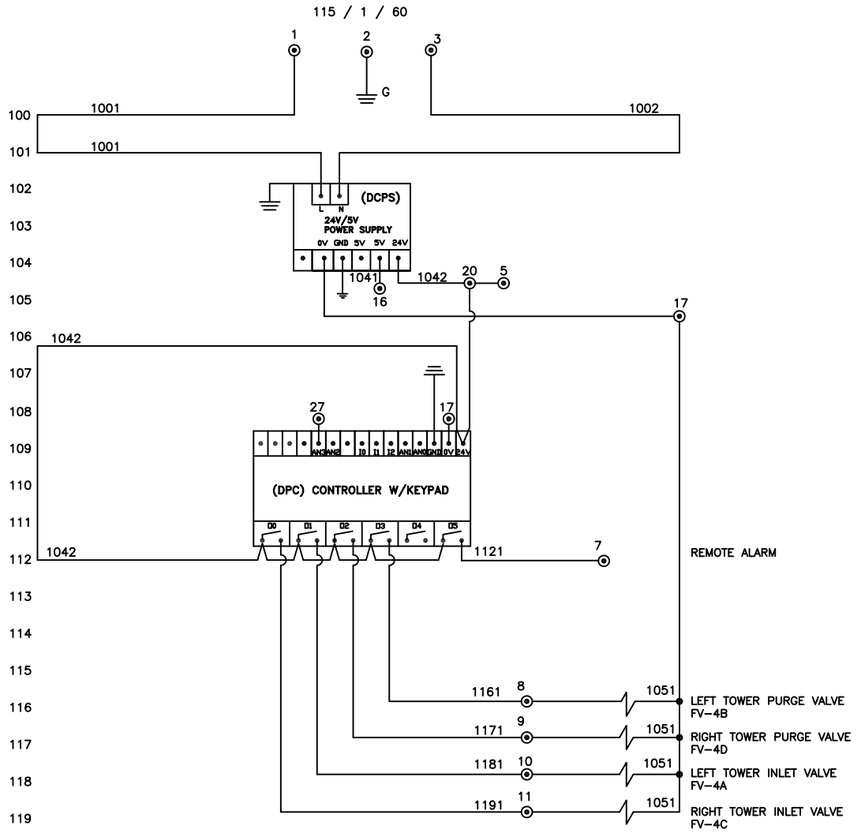
Ingersoll Rand

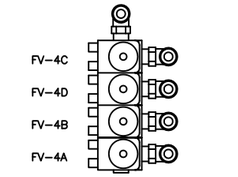
TITLE
GENERAL ARRANGEMENT
PREFILTER & AFTERFILTER
~~EH & HB 1800 - 8000 SCFM &~~ ~~HL 1500 - 5000 SCFM~~

SIZE	ESTIMATED WEIGHT	DRAWING NO	REVISION
B		580086	G

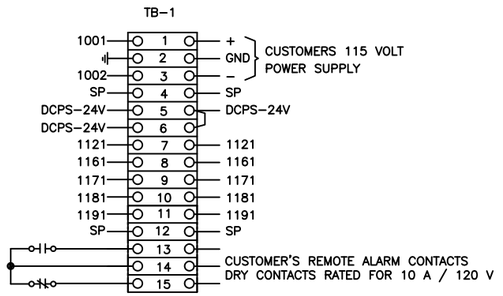
SCALE NONE | UNIT | SHEET 3 OF 3

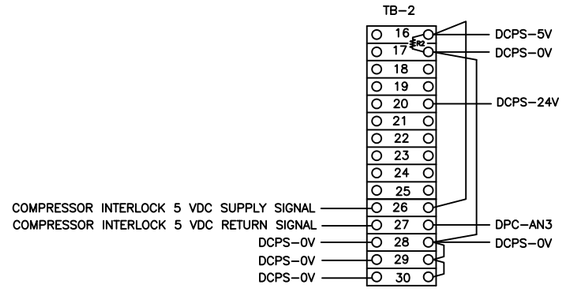
REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DWN	APV
	A		REVISE DRAWING FOR CLARITY	3/1/07	DG	CFW
	B	6428	COMPRESSOR INTERLOCK INPUT WAS AN1	8/6/07	BSA	CFW
	C	–	ADDED MODEL HL90	11/19/09	SAJ	CFW



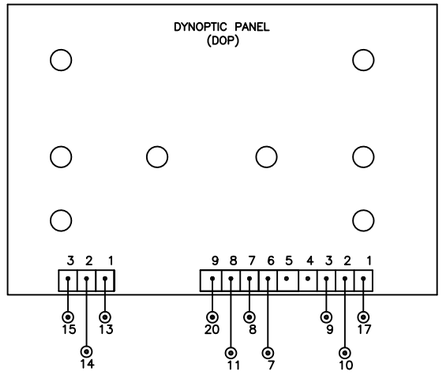


VALVE ORIENTATION WITHIN ENCLOSURE





R2 = 200 OHM, 1/2 W, 5 %



NOTES:

1) ALL 115 V POWER CONTROL WIRE IS BLACK, ALL COMMON CONTROL WIRE IS WHITE, ALL DC VOLTAGE WIRE IS BLUE (+) AND BLUE WITH WHITE STRIPE (–)..

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THIRD ANGLE PROJECTION

DRAWN	DATE
SAJ	10/23/06
CHECKED	
APPROVED	
CFW	11/17/06

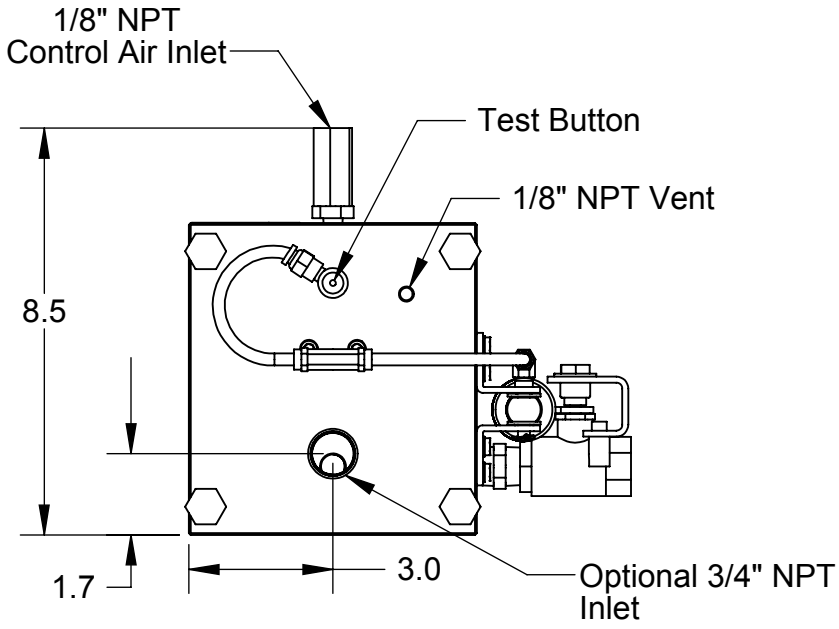
Ingersoll Rand

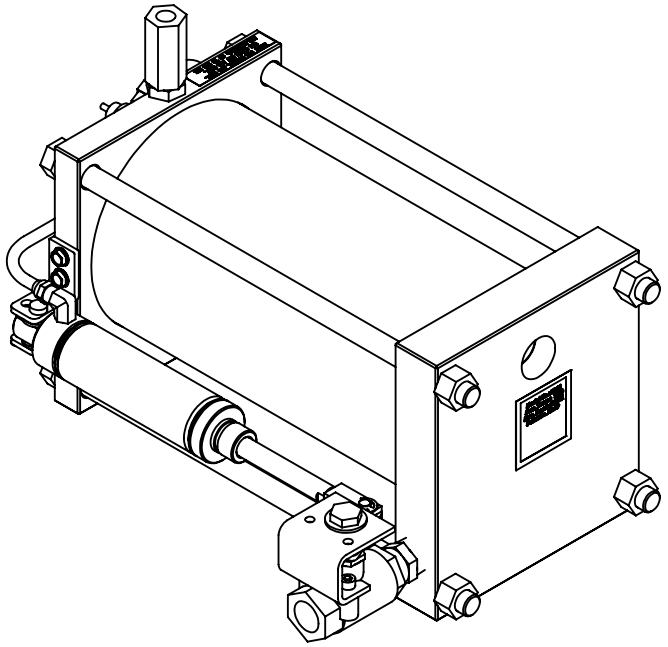
TITLE: WIRING DIAGRAM HL DRYERS STANDARD 90 – 2700

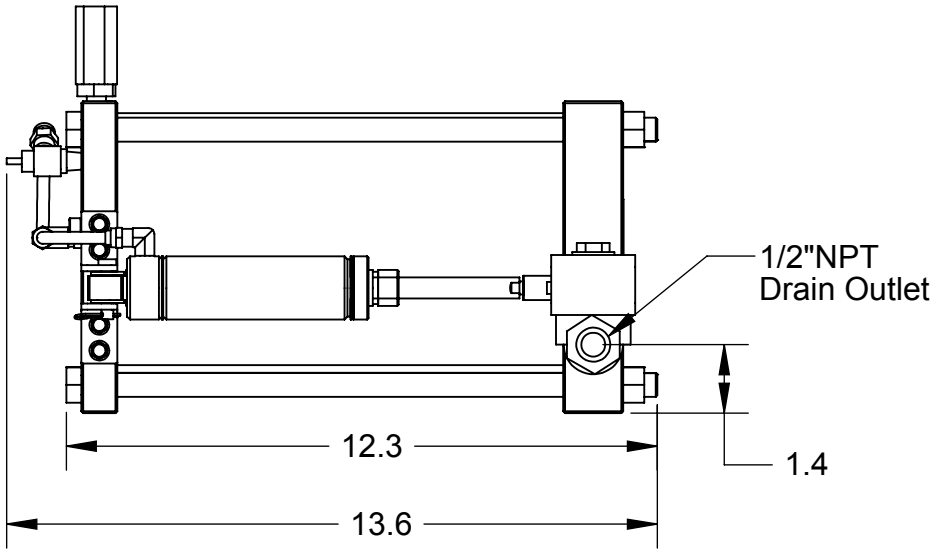
SIZE	ESTIMATED WEIGHT	DWG NO.	REV
B		580023	C

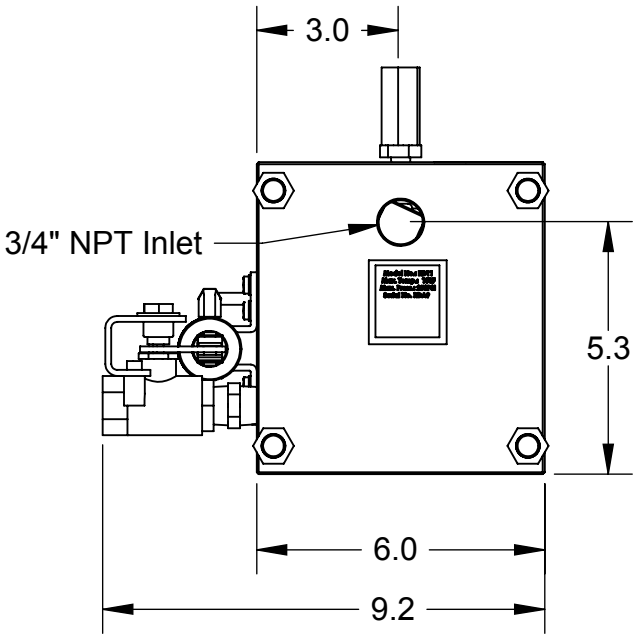
SCALE: NONE UNIT: SHEET 1 OF 1

6/18/2015









IR PNLDII-28 with optional test button.

PNLDII-28-Outline (02/25/10)

80442833
Revision F
October 2012

HL Series Desiccant Dryer

MODELS 90-5000

Operator's Manual

- EN Operator's Manual
- ES Manual Del Operador
- FR Manuel De L'opérateur
- PT Manual do Operador

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ENGLISH
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FRENCH
PORTUGUESES

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Ingersoll Rand

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2.0 INTRODUCTION

The **Ingersoll Rand** Heatless Desiccant Dryers are designed to adsorb moisture from compressed air. The dryers are constructed with two towers, each containing desiccant beads, that alternate between online (drying) and offline (regenerating) modes, yielding a continuous stream of dry air at the dryer's outlet.

During normal operation, wet air passes through the on line tower and water vapor from the air is adsorbed (collected) on the desiccant beads. While air is being adsorbed in the online tower, the moisture on the desiccant in the offline tower is removed by a process called desorption (regeneration). After an initial rapid depressurization, a portion of dried air from the online tower passes over the desiccant bed and carries the moisture off the bed and out the dryer's exhaust.

The continuous, alternating process of adsorption and desorption is controlled using a timer that switches the towers in a specific timed sequence. Very dry compressed air dew points are achieved through the continuous switching and operation of this dryer. **Ingersoll Rand** offers dryers to provide either -40°F or -100°F pressure dew point outlet air.

3.0 WARRANTY

The Company warrants that the equipment manufactured by it and delivered hereunder will be free of defects in material and workmanship for a period of twelve months from the date of placing the Equipment in operation or eighteen months from the date of shipment from the factory, whichever shall first occur. The Purchaser shall be obligated to promptly report any failure to conform to this warranty, in writing to the Company in said period, whereupon the Company shall, at its option, correct such nonconformity, by suitable repair to such equipment or, furnish a replacement part F.O.B. point of shipment, provided the Purchaser has stored, installed, maintained and operated such Equipment in accordance with good industry practices and has complied with specific recommendations of the Company. Accessories or equipment furnished by the Company, but manufactured by others, shall carry whatever warranty the manufacturers have conveyed to the Company and which can be passed on to the Purchaser. The Company shall not be liable for any repairs, replacements, or adjustments to the Equipment or any costs of labour performed by the Purchaser or others without Company's prior written approval.

The effects of corrosion, erosion and normal wear and tear are specifically excluded. Performance warranties are limited to those specifically stated within the Company's proposal. Unless responsibility for meeting such performance warranties are limited to specified tests, the Company's obligation shall be to correct in the manner and for the period of time provided above.

THE COMPANY MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES OF MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HERBY DISCLAIMED.

Correction by the Company of non conformities whether patent or latent, in the manner and for the period of time provided above, shall constitute fulfilment of all liabilities of the Company for such non conformities whether based on contract, warranty negligence, indemnity, strict liability or otherwise with respect to or arising out of such Equipment.

The Purchaser shall not operate Equipment which is considered to be defective, without first notifying the Company in writing of its intention to do so. Any such use of Equipment will be at Purchaser's sole risk and liability.

Note that this is **Ingersoll Rand** standard warranty. Any warranty in force at the time of purchase of the equipment or negotiated as part of the purchase order may take precedence over this warranty.

4.0 HEATLESS DRYER NOMENCLATURE

PREFIX	NOMINAL* FLOW (m^3/hr)	POWER / DEW POINT	NEMA/ MAWP	ELECTRICAL OPTION	ELECTRICAL OPTION	MECHANICAL OPTION	FILTERS
HL	90-5000	1 = 115 / -40 B = 115/ -100 3=200-1-50/-40 E=220-1-50/-100	H = NEMA 4 / 150 psig MAWP	0 = Standard F = EMS for Heatless Dryers	0 = Standard	A = Downstream Purge (Standard)	A = Filters Attached L = Filters Loose

* Nominal Flows indicated are for 100°F inlet temperature, 100°F ambient temperature and 100 psig compressed air pressure.

⚠ NOTICE

Nomenclature shown above represents standard price sheet options. Other options are available, refer to nomenclature insert specific to your dryer for details.

5.0 RECEIVING AND INSPECTION

5.1 INSPECTION

Upon receiving your **Ingersoll Rand** air dryer, please inspect the unit closely. If rough handling has been detected, please note it on your delivery receipt, especially if the dryer will not be immediately uncrated. Obtaining the delivery person's signed agreement to any noted damages will facilitate any insurance claims

5.2 UNPACKING AND HANDLING

⚠ WARNING

Under no circumstances should any person attempt to lift heavy objects without proper lifting equipment (i.e., crane, hoist, slings or fork truck). Lifting any unit without proper lifting equipment, can cause serious injury.

Refer to labels on the dryer for the appropriate means for lifting or moving the dryer. When lifting the dryer, ensure that no stress is applied to the piping or valving. Refer to Section 9.2 for locating and mounting of dryer.

6.0 SAFETY AND OPERATION PRECAUTIONS

Because an air dryer is pressurized and contains rotating parts, the same precautions should be observed as with any piece of machinery of this type where carelessness in operation or maintenance could be hazardous to personnel. In addition to obvious safety rules that should be followed with this type of machinery, safety precautions as listed below must be observed:

1. Only qualified personnel shall be permitted to adjust, perform maintenance or repair this air dryer.
2. Read all instructions completely before operating unit.
3. Pull main electrical disconnect switch and disconnect any separate control lines, if used, before attempting to work or perform maintenance on the unit.
4. Do not attempt to service any part while machine is in an operational mode.
5. Do not attempt to remove any parts without first relieving the entire air system of pressure.
6. Do not operate the dryer at pressures in excess of its rating.
7. Do not operate the dryer without guards, shields and screen in place.
8. Inspect unit daily to observe and correct any unsafe operating conditions.

OSHA
Heading Descriptions

⚠ WARNING

"Warning" is used to indicate a hazardous situation which has some probability of death or severe injury. Warning should not be considered for property damage accidents unless personal injury risk is present.

⚠ ATTENTION

"Caution" is used to indicate a hazardous situation which may result in minor or moderate injury.

⚠ NOTICE

"Notice" is used to indicate a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property. Notice should not be associated directly with a hazard or hazardous situation and must not be used in place of "Danger," "Warning," or "Caution.

⚠ NOTICE

The user of any air dryer manufactured by Ingersoll Rand, is hereby warned that failure to follow the above Safety and Operation Precautions may result in personal injury or equipment damage. However, Ingersoll Rand does not state as fact, nor does it mean to imply, that the preceding list of Safety and Operating Precautions is all inclusive, and further, that the observance of this list will prevent all personal injury or equipment damage.

7.1 INTRODUCTION

As described in Section 2, water vapor is removed from compressed air by diverting air flow alternately between two towers filled with desiccant. While one tower processes the compressed air stream, adsorbing water vapor, the opposite tower is regenerated by desorbing the water vapor and venting it to atmosphere. Refer to the Flow Diagram for a visual representation of the drying and regenerating cycles.

7.2 DRYING CYCLE

Saturated compressed air enters the dryer and is diverted to the appropriate tower by the Inlet Flow Valves. Referring to the Flow Diagram (Section 16.0), the Left Inlet Flow Valve is actuated to a closed position to prevent air flow from entering the regenerating tower. Simultaneously, the Right Inlet Flow Valve is actuated to an open position, allowing air flow to the right hand tower. During this time, the Right Tower Purge Valve is actuated to a closed position, preventing the compressed air from venting to atmosphere. As the compressed air flows through the desiccant material at pressure, removal of water vapor from the air stream begins to occur through adsorption. In the adsorption process, the desiccant material draws water vapor out of the compressed air and "holds" it until the right tower drying cycle is complete. Compressed air flows out of the tower for delivery to the process use. The Outlet Flow Check Valves provide air flow diversion to the outlet air connection of the dryer. The Right Outlet Flow Check Valve allows air flow through to the outlet connection of the dryer while The Left Outlet Flow Check Valve checks off to prevent flow back to the regenerating tower.

7.3 REGENERATION CYCLE

Previously adsorbed moisture, removed from the process stream, gets stripped or desorbed from the desiccant material in the regeneration process. The first stage of regeneration is tower depressurization. After the Inlet Flow Valves are switched to divert air flow away from the regenerating tower, the appropriate Purge Valve will be opened and the tower will be depressurized. Through rapid depressurization, a significant portion of the previously adsorbed water vapor is stripped off of the desiccant material and exhausted to atmosphere.

The second stage of regeneration uses a portion of the dry, compressed air, expanded to atmospheric pressure to complete the desorption process. As shown on the FLow Diagram, the compressed air exits the drying tower and a portion of the air flows through the Purge Adjustment Valve and the Purge Orifice. Once the air has passed through Purge Orifice, it expands to atmospheric pressure and continues the regeneration process. Desorption occurs as the desiccant releases water vapor into the regeneration air and is exhausted through the Purge Muffler.

Heatless dryers are equipped with the ability to use air from a downstream source to purge the regenerating towers. This feature is useful for applications with downstream (dry) storage tanks, as pulling air from a downstream source can minimize cycling of the air compressor.

7.4 SETTING THE REGENERATION AIR FLOW

Proper setting of the purge is necessary to achieve proper dryer performance. Setting the purge flow too high will waste compressed air and if set too low, the dryer will not achieve proper dew point performance.

The purge adjustment manifold consists of the Purge Adjustment Valve, the Purge Pressure Gauge and the Purge Orifice. Manually adjust the Purge Adjustment Valve until the gauge reading on the purge pressure gauge matches the Purge Pressure Gauge setting listed on the laminated tag affixed to the Orifice Plate Assembly.

⚠ NOTICE

On dryers equipped with the optional EMS feature, the purge valve MUST be set to the factory set point to ensure proper operation of this feature.

7.5 TOWER REPRESSURIZATION

Upon completion of tower regeneration, and prior to the Inlet Flow Valves changing position to switch towers, the regenerated tower must be repressurized.

⚠ NOTICE

Failure to re-pressurize prior to tower switchover will result in shocking the desiccant material and cause premature desiccant dusting.

Repressurization is accomplished by closing the appropriate Purge Valve. Closing the Purge Valve allows the regeneration air to begin to pressurize the tower. In addition to the regeneration air, the Repressurization Valve, (standard on -100°F dew point and high pressure dryers) opens allowing some additional air from the outlet of the dryer to ensure adequate pressurization. During normal tower regeneration, the Repressurization Valve is held closed so that the only source of air for regeneration passes through the purge adjustment assembly.

7.6 VALVES

Solenoid control valves are used to actuate the Flow Valves, Purge Valves and the optional Repressurization Valve on Heatless Dryers. The Inlet Flow Valves and optional Repressurization Valve are normally open valves, while the Purge Valves are connected as normally closed valves. This arrangement permits air to flow through the dryer during periods of loss of power.

Outlet Check Valves are single direction check valves that will

allow flow in the direction shown on the Flow Diagram, but not allow flow in the opposite direction.

7.7 TIMING SEQUENCE

All timing functions are controlled by the Microprocessor Controller. Timing for HL Series dryers is as follows:

7.7.1 TIMING CYCLE FOR -40°F DEW POINT DRYERS

The standard timing cycle for -40°F operation switches the Inlet Flow Valve position every five minutes which alternates the drying tower. At the same time as a tower Inlet Valve opens, the appropriate tower Purge Valve opens to depressurize the regenerating tower. Tower regeneration occurs for 4 minutes and 15 seconds, at which time the Purge Valve closes to initiate repressurization.

7.7.2 TIMING CYCLE FOR -100°F DEW POINT DRYERS

The standard timing cycle for -100°F operation switches the Inlet Flow Valve position every 2 minutes which alternates the drying tower. At the same time as a tower Inlet Valve opens, the appropriate tower Purge Valve opens to depressurize the regenerating tower. Tower regeneration occurs for 1 minute and 50 seconds, at which time the Purge Valve closes to initiate repressurization. The Repressurization Valve opens to assist tower repressurization for the last 10 seconds prior to Inlet Flow Valve switching.

7.8 CONTROLS

The Microprocessor Controller controls all pneumatic valve operation and dryer functions as well as communicates dryer alarms. The Microprocessor Controller stores the last 20 alarm conditions, displaying the alarm and the time and date the alarm occurred. This useful feature can greatly facilitate troubleshooting of the dryer.

The Microprocessor Controller features three levels of access. The default level CUSTOMER MODE permits viewing of various drying parameters. A protected TECHNICIAN MODE permits access to and manipulation of additional parameters. A password protected FACTORY MODE is also included for use with **Ingersoll Rand** Service Personnel for troubleshooting the dryer.

7.8.1 BASIC USER INTERFACE

The Microprocessor Control display provides the user with the operating parameters and their corresponding values. When power is supplied to the dryer, the Microprocessor Control will illuminate and default to the "Standby" mode, displaying the "Press ON" prompt.

The following illustration summarizes the keypad functions.

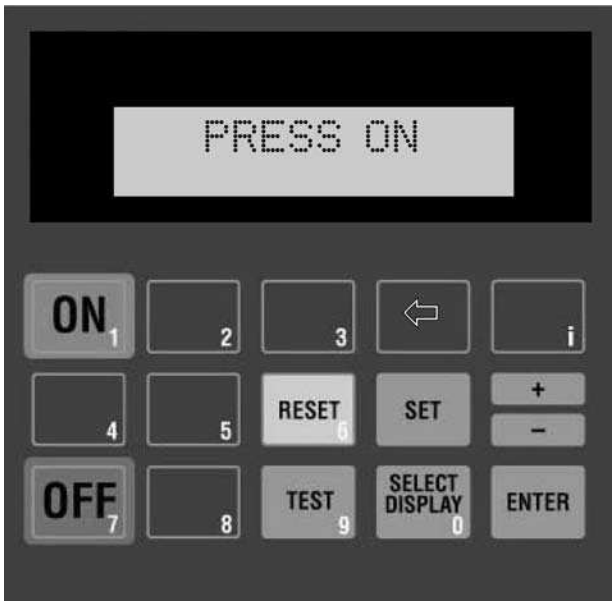


FIGURE 1 - MICROPROCESSOR CONTROLLER

BUTTONS

- ON
  Initiates PLC program. Begins system monitoring and valve switching functions.
- OFF
  Stops PLC program. Stops valve switching functions. Initiates shutdown sequence. Opens Inlet Flow Valves. Closes Purge Valves.
- SELECT DISPLAY
  Allows the user to scroll through the available displays. The last display selected will remain displayed as the default display.
- + / -
  Allows user to modify set point values. Set point values cycle through a fixed range. Also allows entering negative numbers in Factory Modes.
- ⇦ or "blank" button
  Allows user to step backwards to the previous level of the menu.
- RESET
  Pressing once clears the local alarm indication and de-energizes the remote alarm contact for many alarm conditions. Should the alarm condition persist, the alarm will return after the alarm inhibit time has expired.
- SET
  Permits the adjustment of parameters in FACTORY MODES.
- ENTER
  Used to accept changed parameters and set point values.
- TEST
  Not used in Desiccant Dryer applications
- i
  Restricted Level access for factory use only.

The status panel provides clear indication of dryer status via bright LED indicators.
The following illustration summarizes the panel's features:

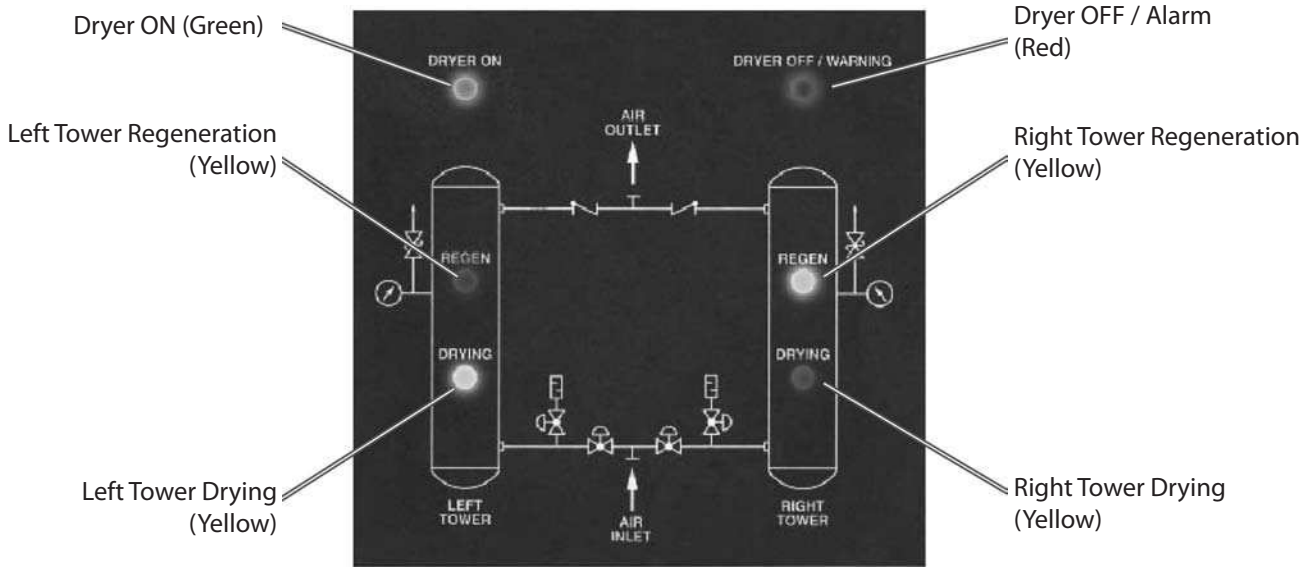


FIGURE 2 - STATUS PANEL

7.8.2 MICROPROCESSOR CONTROL DISPLAY PARAMETERS

The Microprocessor Controller is capable of displaying a number of system parameters. The following summarizes the parameters that can be accessed by depressing the SELECT DISPLAY button from the Microprocessor Controller. (Note that some displays are optional and may not appear on all models):

- Tower Status {LT DRY / RT REGEN or LT REGEN / RT DRY}: Provides visual confirmation of tower drying and regenerating status.
- Step Timer {ie STEP 4 TIME 120}: Information screen displaying the current step in the program and the time remaining for the displayed step.
- Dew Point Temperature (OPTIONAL) - {DEW POINT TEMP: XX}: When equipped with the Energy Management System (EMS) feature, provides accurate display of dryer outlet pressure dew point.
- Purge Status (OPTIONAL) - {PURGE / NO PURGE}: Indicates whether unit is currently consuming purging air. Requires EMS.
- Alarms {ALARM LIST - PRESS ENTER}: Depressing <ENT> at this prompt permits viewing of current alarm status and alarm history.
- Operating & Purge Times - {OPERATING TIMES - PRESS ENTER}: Depressing <ENT> at this prompt provides access to the operating and purge hours of operation.
- Operating Mode {OPERATING MODE: HEATLESS}: Indicates mode of operation for dryer.

7.8.3 ALARMS AND THEIR FUNCTIONS

There are several alarms detected by the Microprocessor Control to alert the user of an out of tolerance condition. Once each alarm is detected, a description of the alarm will appear in the screen and the remote alarm contact will close. Note that during the alarm condition, the SELECT DISPLAY button may be depressed to scroll through the available parameters. After approximately 30 seconds, the alarm screen will reappear, provided the alarm condition persists.

Fail to Shift Alarm (OPTIONAL) - (FAIL TO SHIFT) Pressure switches are provided to detect the pressure within each tower. At "0" psig the switches are normally closed which sends a signal to the controller. When the towers pressurize, the switches open, thus removing the signal to the controller. During the cycle, the Microprocessor Controller interrogates the pressure switches to determine their current position. The Microprocessor Controller compares their position to a look-up table within the program. If the position of either switch differs from the switch's proper position, the dryer will initiate the Fail to Shift Alarm.

High Dew Point Alarm (OPTIONAL) - (HIGH DEW POINT) When the heatless dryer is equipped with the optional EMS feature, a sensor is provided that senses the outlet pressure dew point of the air and displays the value on the Microprocessor Controller. For dryers equipped with the optional EMS feature, the sensor is used to detect a high dew point condition and displays the alarm as "High Dew Point".

Alarm List

The Microprocessor Controller stores the 20 most recent alarm conditions. These alarms are stored with the type of alarm as well as the date and time the alarm occurred. This list can greatly facilitate troubleshooting the dryer and provide an indication of dryer operation during unattended service. The following describe the method to access and review the alarms stored in the Microprocessor Controller:

Depressing the SELECT DISPLAY button will reveal the previous alarm condition(s), as well as the remaining available alarm placeholders for alarms. To EXIT the ALARM LIST, perform the following:

Depress the SELECT DISPLAY button until the ALARM LIST display appears.

Depressing the ENTER button enters the ALARM LIST menu.

Depressing the SELECT DISPLAY button advances the menu to the current alarm status.

SELECT DISPLAY

HIGH DEW POINT
TM 1635 DATE 1104

Depressing the SELECT DISPLAY list displays the most recent of the alarms stored by the Microprocessor Control. Refer to the diagram at the end of this section for an explanation of the ALARM LIST Display.

⇦

BEGIN ALARMS

Depressing the ⇦ button returns the controller to the top of the ALARM LIST.

⇦

ALARM LIST
PRESS ENTER

Depressing the ⇦ button again returns the controller to the CUSTOMER MODE.

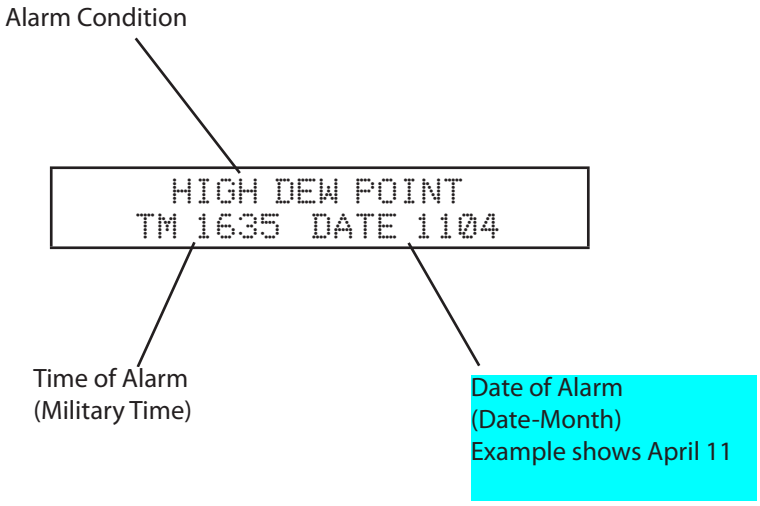


FIGURE 3 - ALARM SCREEN DETAILS

7.8.4 RESTART MODES AND OPERATING DISPLAYS

7.8.4.1 Restart Mode

The Microprocessor Controller includes a Shutdown Sequence that is activated when the dryer OFF button is depressed. This feature positions the valves to their failsafe position and resets the program and is the recommended method of shutting down the dryer. When the dryer is subsequently energized, the dryer is ready to run at the start of the program. Should the Desiccant dryer power fail unexpectedly, the dryer may be set to restart in one of two start modes.

Manual Mode (ZERO)

Ingersoll Rand dryers are shipped from the factory in the Manual Mode. After power is supplied to the dryer after a loss of power, the "PRESS ON" display will appear. The valve switching and timing operations will only start once the ON button is depressed. In this configuration, to restart the dryer, the user must manually depress the ON button on the Microprocessor Control panel.

Auto Restart Mode (LAST)

In this mode, the dryer will start automatically once power is re-applied to the dryer. The Microprocessor Control will pick up where it left off in the program once power is applied.

7.8.4.2 Operation Hours

In the CUSTOMER MODE, the Microprocessor Controller provides access to the operating hours of the dryer. The following describe the method to access and review the operating and purge hours for the dryer:

Depress the SELECT DISPLAY button until the OPERATING TIMES display appears.

Depressing the ENTER button enters the OPERATING TIMES menu.

Depressing the SELECT DISPLAY button displays the cumulative operating hours of the dryer.

Depressing the SELECT DISPLAY button displays the cumulative hours the dryer has used purge air.

Depressing the ENTER button returns the display to the top of the OPERATING TIMES menu.

Depressing the ⇦ button returns the controller to the CUSTOMER MODE

8.1 MOISTURE INDICATOR

The moisture indicator senses a sample of the control air which is taken from the dryer outlet. The indicator provides a gross indication of dew point deterioration at the outlet of the dryer. Under normal operating conditions, the indicator is blue. In the event of a dryer malfunction or prolonged dryer shut down, it will turn gray in the presence of moisture.

8.2 FAILURE TO SHIFT ALARM (OPTIONAL)

The Failure to Shift Alarm provides an indication of switching failure in one of the dryer switching valves. The Fail to Shift Alarm uses a pressure switch to monitor the pressure in each tower. At "0" PSIG the switches are normally closed which sends a signal to the controller. When the towers pressurize, the switches open, thus removing the signal to the controller. The controller anticipates the appropriate open and closed switch position based on its timing sequence. If either switch is in an incorrect position, the alarm light will illuminate.

8.3 ENERGY MANAGEMENT SYSTEM (EMS) - (OPTIONAL)

Ingersoll Rand's EMS system is designed to minimize the loss of purge air during low flow or low water loading conditions. A digital dew point sensor is used to detect the actual outlet pressure dew point of the process air. The sensor communicates the pressure dew point reading to the Microprocessor Controller. The Microprocessor Controller interprets whether the outlet pressure dew point is above or at the EMS set point. As long as the outlet pressure dew point is dryer than the set point, the Microprocessor Controller will not allow the Purge Valves to open. The dryer will however, continue to cycle back and forth between towers. Once the EMS threshold is reached, the Microprocessor Controller will initiate the regeneration cycle and the appropriate Purge Valve will open.

⚠ NOTICE

At initial start-up or after desiccant changeout, the new desiccant has a moisture holding capacity higher than the dryer's design regeneration capabilities. The desiccant stabilizes to an "aged" state after three to six months of use. Ingersoll Rand recommends keeping the EMS feature off for one to two weeks from initial start-up or desiccant replacement. Activating the EMS after this period will insure proper operation of the EMS.

8.4 HIGH DEW POINT ALARM (INCLUDED WITH EMS)

The purpose of the High Dew Point Alarm is to provide the operator an alarm indication should the equipment fail to supply air at its designed pressure dew point. The EMS dew point sensor communicates the pressure dew point reading to the Microprocessor Controller. Should the pressure dew point rise above the alarm set point, the Microprocessor Controller will display the alarm condition on the controller screen.

8.5 COMPRESSOR INTERLOCK

Compressor Interlock adjusts the operation of the dryer to use purge air only when the air compressor is LOADING or ON. For installations with significant downstream air storage, this feature closes the purge valves if the compressor is not delivering flow after completion of the current tower purge cycle. This feature requires a relay (supplied by others) on the air compressor to indicate whether the air compressor is LOADING or ON vs. UNLOADING or OFF. Prior to using this feature, the relay must be wired to the 5V DC terminal strip in the dryer's electrical enclosure (refer to the appropriate wiring diagram). The dryer will provide the 5V DC power. For proper operation, the air compressor ON or LOAD signal should correspond with the relay being closed. The OFF or UNLOAD signal must correspond to the relay being open.

Adjusting the purge cycle to correlate with the operation of the air compressor minimizes the potential for the air compressor to cycle and saves the energy associated with generating unnecessary purge air.

9.1 APPLICATION AND CHECK ANALYSIS

To achieve the best dryer performance, you should carefully check that the design and installation requirements outlined below are satisfied.

⚠ NOTICE

The standard dryer is not rated for any gas other than air.

Operating pressure of **Ingersoll Rand** dryers can range from 75 -150 PSIG. Air available for your usage will vary with operating pressure. The maximum design pressure of the **Ingersoll Rand** Heatless Dryer is 150 PSIG. For units required for higher operating pressures, consult your **Ingersoll Rand** representative.

The dryer must never be installed where air and/or ambient temperature exceeds 120°F or drops below +50°F. Locate dryer to avoid extremes of heat and cold from ambient or other conditions. Avoid locating dryer outside or where it is exposed to the elements.

⚠ NOTICE

Ingersoll Rand recommends that the mufflers be cleaned after initial start-up to remove any desiccant dust generated during shipment. After running dryer for initial 30 minute period, de-energize / depressurize dryer and remove mufflers. Disassemble and clean the removable insert inside the muffler core. Reinstall mufflers prior to operating dryer.

9.2 LOCATING AND MOUNTING

Lift the dryer only by the lifting points indicated by the lifting labels on the dryer.

If the dryer has been shipped with desiccant packaged separately, install the desiccant after locating and mounting. Desiccant has been provided separate to minimize handling difficulty and placing unnecessary stress on the dryer assembly

Bolt the dryer to the foundation using the bolt holes provided in the base frame. Anchor bolts should project a minimum of 3.5 inches above the foundation. Refer to General Arrangement drawing for details.

9.3 PIPING

Pipe the compressed air lines to the inlet and outlet connections. Locate the pre-filters as close as possible to the dryer. Ensure the positioning allows for ease of servicing. Refer to the General Arrangement drawing.

Note that the wet air inlet is at the dryer's lower manifold, while the dry air outlet is at the dryer's upper manifold. In situations where air supply is required 24 hours a day (it is undesirable to interrupt the airflow), a three valve by-pass system is recommended to bypass the dryer. Use the fewest elbows necessary to keep pressure drop at a minimum.

Once all piping has been connected, all joints including those on the dryer, should be soap bubble tested at line pressure to ensure no joints have been damaged in transit and site placement.

9.4 FILTRATION

It is important that a pre-filter and an post-filter be provided in your dryer installation. All dryers are supplied with a pre-filter and post-filter as standard. They are mounted on the HL1200 and smaller. They are shipped loose on the HL1500 and larger.

⚠ NOTICE

All dryers must have proper filtration. A .3 micron coalescing filter with automatic drain & particulate after filter must be used as a minimum. Failure to provide proper filtration for dryer will void warranty.

Coalescing pre-filters, located before the dryer, protect desiccant beds from contamination by oil, entrained water, pipe scale, etc., thereby, extending dryer desiccant life. Locate pre-filters as close to dryer as possible.

It is recommended that a mechanical separator be installed immediately preceding the pre-filter to remove the bulk liquid and entrained water.

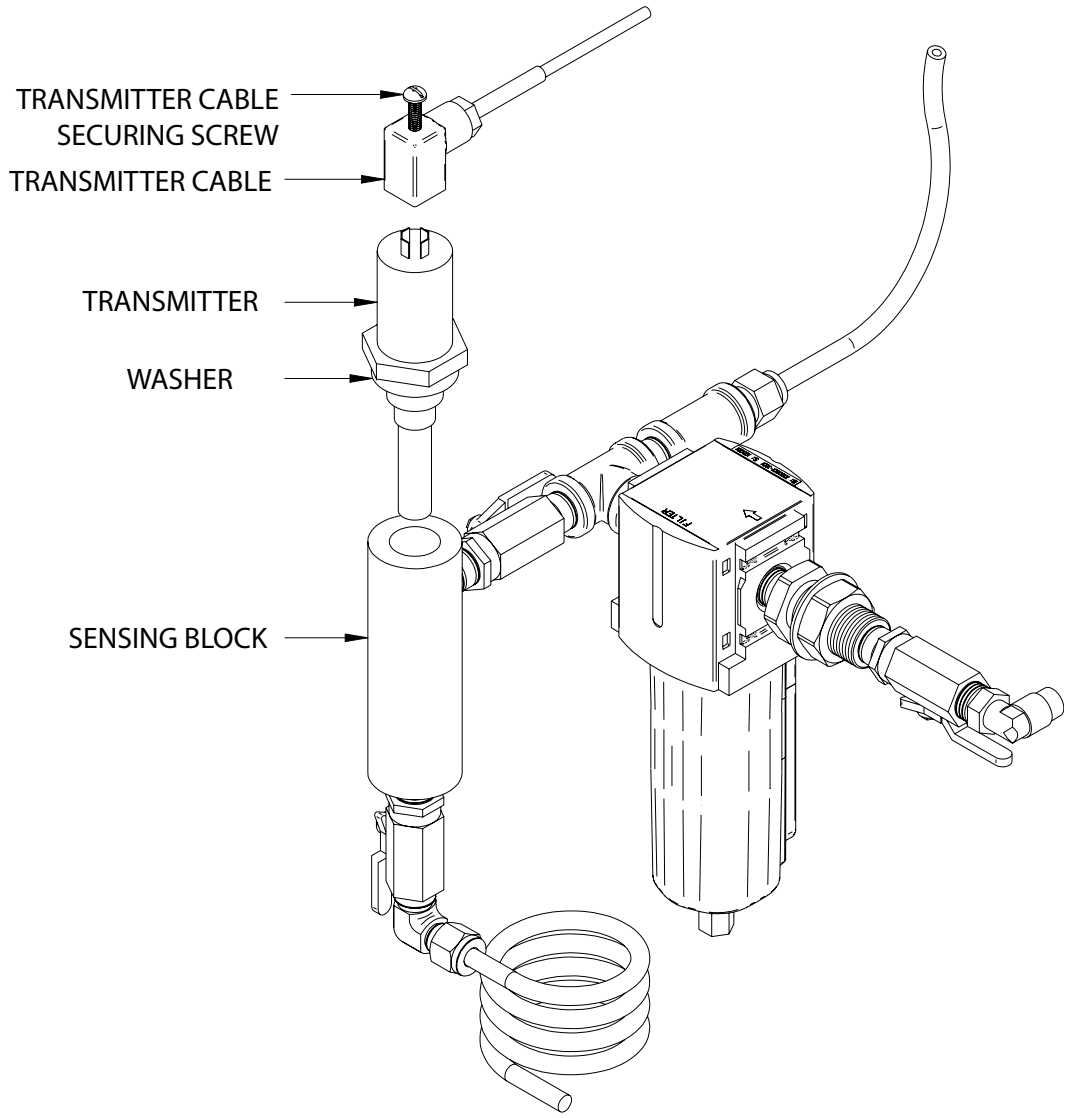
Particulate post-filters, located after the dryer, help eliminate the possibility of desiccant dusting and carryover into the air system.

9.5 DEW POINT TRANSMITTER INSTALLATION (OPTIONAL)

On dryers equipped with EMS, the dew point transmitter is shipped in a separate container within the electrical enclosure to protect the transmitter during shipment. Prior to using the EMS feature, the transmitter must be installed in the sensor block located on the side of or behind the electrical enclosure and the transmitter cable fastened to the sensor. Note that the transmitter should only be installed when the dryer is ready to be commissioned.

To install the Dew Point Transmitter:

- Remove Transmitter from original packaging.
- Verify that Washer is placed below Transmitter hex.
- Thread the Transmitter into the Sensor Block as shown.
- Attach the Transmitter Cable to the Transmitter. Be sure to fully engage the Transmitter Cable Securing Screw into the mating thread in the Transmitter.



9.6 ELECTRICAL CONNECTION

Make all electrical connections to the dryer as shown on the wiring diagram. Care must be taken in connecting the proper voltages.

⚠ NOTICE

Dryer must be grounded with the full sized ground wire connected to an earth ground.

⚠ NOTICE

Dryer must be fused according to NEC with the size fuse listed on the dryer serial nameplate, or on specification sheet in technical manual.

Size field connection knock-out for the conduit fitting required by the NEC.

9.7 DESICCANT LEVEL VERIFICATION

Remove desiccant fill port and the top of the desiccant vessel and check desiccant level. The level should be consistent with the level depicted on the Desiccant Fill Chart at the end of the manual. The initial charge of desiccant is installed in the dryers at the factory on models HL 2700 and smaller.

9.8 START-UP

- Slowly pressurize the dryer. When the dryer reaches full operating pressure, check the system for air leaks. Soap test all joints and fitting. To maintain desired dew point, any leaks detected must be fixed, especially those on the outlet side of the dryer.
- Make sure that the purge adjustment valve is open and air outlet shut off valve (if equipped) is closed**.**
- For dryers equipped with EMS, remove the dew point monitor sensor from the electrical enclosure and install in the sensing block, located beside the enclosure and attach the sensor cable to the sensor.

- Turn on dryer disconnect switch (supplied by customer) to apply power to the dryer. The LCD display on the Microprocessor Controller will illuminate.
- Start dryer by depressing the ON button on the Microprocessor Controller.
- For the first 30 seconds that the dryer is energized, both purge valves will remain closed. After 30 seconds, the left tower purge valve will be opened and depressurization of the left tower will occur.
- With a voltmeter, check the power connections for the correct voltage shown on the dryer serial nameplate.
- Close and secure all electrical panel covers.
- The Microprocessor Controller will indicate that the left tower is drying. The dryer will operate in the sequence described in Section 7.
- Following depressurization, adjust purge valve as described in Section 7.4

⚠ NOTICE

At initial start-up, check the dryer operation for one or two cycles, especially at the time of the tower shift. Verify that all systems are operating in their proper order and sequence. If the dryer is not functioning properly, contact distributor or Ingersoll Rand Technical Service.

- If the dryer has been in storage or off for an extended period of time, the Blue Moisture Indicator may be gray, the High Dew Point Alarm (if equipped) may be activated and the dew point display (if equipped) may indicate a high dew point. Depending upon the duration of idle time, it may take anywhere from one to twelve hours for the alarm condition to go out, the BMI to return to its normal blue state and the dew point to drop.
- Slowly open the outlet valve to gradually pressurize the down stream piping.

⚠ NOTICE

When opening the outlet valve, insure drying tower gauge maintains line pressure. Allowing pressure to drop in the dryer will result in an overflow condition.

⚠ NOTICE

-100° F dryers require flow through the dryer to lower the pressure dew point to design levels. Failure to permit air flow through dryer (deadheading) will result in elevated outlet dew points. Once air is permitted to flow through the dryer, the pressure dew point will gradually reduce to design levels.

9.9 SHUT-DOWN SEQUENCE

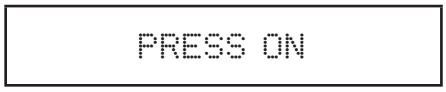
⚠ NOTICE

Prior to removing power or compressed air from the dryer, depress the OFF button on the Microprocessor Control This initiates the Shutdown Sequence, which closes the purge valves, repressurizes the off-line tower and opens the flow valves. DO NOT REMOVE POWER OR COMPRESSED AIR FROM THE DRYER DURING THE SHUTDOWN SEQUENCE.

- Maintain a compressed air source to the dryer and a supply of power to the Microprocessor Controller.

Depress the OFF button to initiate the SHUTDOWN SEQUENCE.

- Permit the dryer to complete the full SHUTDOWN SEQUENCE (30 seconds)



Once the PRESS ON Prompt is displayed, the dryer has completed the SHUTDOWN SEQUENCE. Power and air may be safely removed from the dryer.

- De-energize the dryer
- Shut down air compressor or bypass dryer
- Close Isolation Valves (if equipped)

Note: On the subsequent Start-up, the outlet isolation valve should be in the closed position. Slowly open the valve to build pressure downstream.

The Microprocessor Control provides a protected TECHNICIAN MODE to manipulate several parameters not accessible by the casual operator. Below is a list of parameters that can be accessed and manipulated by the technician in the TECHNICIAN MODE:

Parameter	Display	Set Point
DEW POINT ADJUSTER SETTING	PDP ADJUSTER	-40, -4, +38
ENERGY MANAGEMENT SYSTEM (OPTIONAL)	EMS	OFF , ON
ENERGY MANAGEMENT SYSTEM SETPOINT (OPTIONAL) *	EMS SET POINT	-76 - +68
RESTART MODE	RESTART	LAST, ZERO
PURGE FLOW ADJUSTER SETTING	PURGE ADJUSTER	30% - 100%
COMPRESSOR INTERLOCK SETTING	COMP INTERLOCK	OFF , ON
HIGH DEW POINT ALARM ACTIVATION (OPTIONAL)	HIGH DEW POINT	OFF , ON

In TECHNICIAN MODE, the following parameters can be viewed but not changed:

Parameter	Display
OPERATION MODE	HEATLESS

* NOTE: Setpoints indicated are adjustable ONLY when dryer is equipped with the EMS. Setpoints are non-adjustable on dryers without this option

10.1 ENTERING TECHNICIAN MODE

⚠ WARNING

TECHNICIAN MODE should only be entered by qualified service personnel. Altering the set points in TECHNICIAN MODE will have a significant effect on the operation of the dryer. Incorrect set points may damage dryer and cause potential serious injury.

To enter the TECHNICIAN MODE, perform the following keystrokes:

Pressing the "2" and "3" buttons simultaneously enters the TECHNICIAN MODE.

Depressing SELECT DISPLAY scrolls through the available parameters.

10.2 DEW POINT ADJUSTER (-40 °F DRYERS ONLY)

Dew point adjuster allows the user to select between -40 °F, -4 °F and +38°F pressure dew points. Selecting a higher (wetter) pressure dew point lengthens the drying cycle, making the regeneration process commence less frequently than at lower (dryer) dew points. This results in energy savings by depressurizing the system less times per hour. The chart below describes the available outlet pressure dew points that may be selected along with their respective cycle times.

ISO 8573.1 Class	Pressure Dew Point		Cycle Length	Regenerations per hour
2	-40 °F	-40 °C	10 min	12
3	-4 °F	-20 °C	16 min	7.5
4	+38 °F	+3 °C	24 min	5

The following illustrates the method of accessing and adjusting the dew point adjuster feature

Depress the SELECT DISPLAY button until the DEW POINT ADJUSTER screen is displayed.

Depress the +/- button until the desired dew point is displayed. Pressing SELECT DISPLAY saves the current selection.

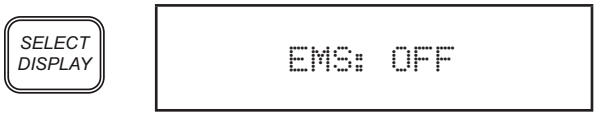
10.3 ENERGY MANAGEMENT SYSTEM (OPTIONAL)

10.3.1 DESCRIPTION AND ACTIVATION

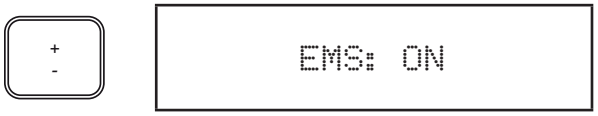
The optional Energy Management System (EMS) feature is designed to minimize the loss of purge air during low flow or low water loading conditions. A digital dew point sensor detects the actual outlet air pressure dew point of the process air.

The sensor communicates the pressure dew point reading to the Microprocessor Controller. Should the pressure dew point be below the EMS set point, the Microprocessor Controller will keep the purge valves closed while the dryer continues to cycle back and forth between towers, thereby saving purge air.

The following illustrates the method of accessing and adjusting the Energy Management System feature:



Depress the SELECT DISPLAY button until the ENERGY MANAGEMENT SYSTEM screen is displayed.

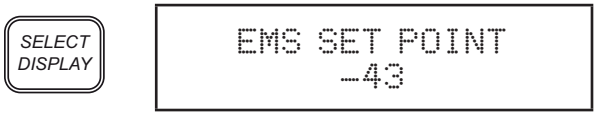


Depress the +/- button until the desired set point is displayed. Pressing SELECT DISPLAY saves the current selection.

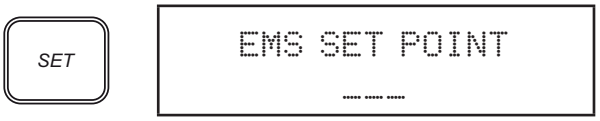
10.3.2 SETPOINT ADJUSTMENT

On dryers equipped with the optional EMS, the Energy Management System setpoint can be adjusted to match the dryers requirements to the desired pressure dew point.

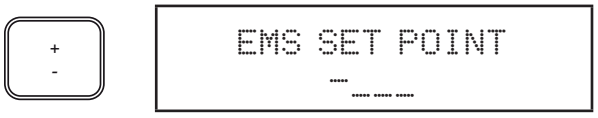
The following illustrates the method of adjusting the setpoint for the Energy Management System feature:



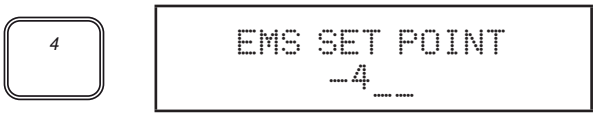
Depress the SELECT DISPLAY button until the EMS SET POINT screen is displayed.



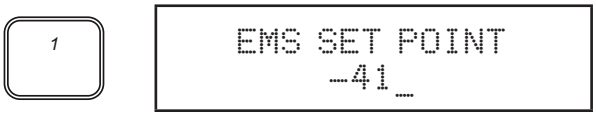
Pressing the SET button permits the value of the EMS SETPOINT to be changed



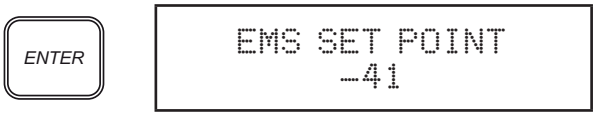
To enter a negative number, depress the +/- button. Otherwise, proceed to the next step.



Use the numbers on the keypad to enter the desired pressure dew point temperature for the EMS setpoint.



Use the numbers on the keypad to enter the desired pressure dew point temperature for the EMS setpoint.



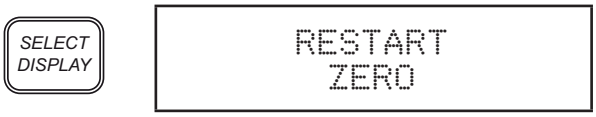
Depressing ENTER saves the selected set point.

⚠ NOTICE

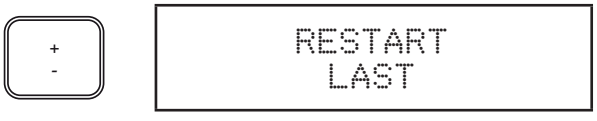
The Energy Management System set point should not be lower (wetter) than the dew point adjuster setting. Failure to do so will prevent the Energy Management System feature from operating. In addition, when operating in EMS, the purge flow adjuster should be set to 100%.

10.4 RESTART MODE

HL Dryers can be configured to restart in one of two operating modes. As described in Section 5, the dryer may be configured for Manual operation (factory default) or Auto Restart, which permits the dryer to restart automatically once power is re-applied to the dryer. The following illustrates the method of accessing and adjusting the different start modes for the dryer:



Depress the SELECT DISPLAY button until the START MODE screen is displayed.



To change the start mode from its current selection to the alternate setting, depress the +/- button until the desired set point is displayed. Pressing SELECT DISPLAY saves the current selection.

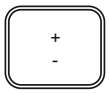
10.5 PURGE FLOW ADJUSTER

Purge flow adjuster allows the user to reduce the duration of the purge cycle to more closely match the inlet conditions

to the dryer. This feature is well suited for applications where the dryer is consistently underflowed, allowing only the required amount of purge air to be used. The purge flow adjuster feature allows the user to select the relative duration of the purge cycle, from 30% to 100%, in 10% increments.

The following illustrates the method of accessing and adjusting the purge flow adjuster feature

Depress the SELECT DISPLAY button until the PURGE FLOW ADJUSTER screen is displayed.



Depress the +/- button until the desired percent purge is displayed. Pressing SELECT DISPLAY saves the current selection.

⚠ NOTICE

On dryers equipped with the optional Energy Management System feature, the purge flow adjuster MUST be set to 100% in order for the Energy Management System to operate properly.

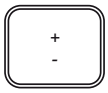
10.6 COMPRESSOR INTERLOCK

Compressor Interlock adjusts the operation of dryer to purge only when the air compressor is LOADING or ON. This feature requires the customer to provide a relay on the air compressor to indicate whether the air compressor is LOADING or ON vs. UNLOADING or OFF. Prior to using this feature, the user must wire the relay to the 5V DC terminal strip in the dryer's electrical enclosure. The dryer will provide the 5V DC power. The air compressor ON or LOAD signal should correspond with the relay being open. The OFF or UNLOAD signal must correspond to the relay being closed.

With the Compressor Interlock properly set-up and activated, the dryer's purge valves will close when the air compressor is not making air, as indicated by the OFF or UNLOAD condition. With the purge cycle corresponding to the demands of the air dryer, cycling of the air compressor is minimized and energy savings is realized by only purging when the air system requires.

The following illustrates the method of accessing and adjusting the Compressor Interlock feature:

Depress the SELECT DISPLAY button until the COMPRESSOR INTERLOCK screen is displayed.



Depress the +/- button until the desired set point is displayed. Pressing SELECT DISPLAY saves the current selection.

10.7 HIGH DEW POINT ALARM (INCLUDED WITH EMS OPTION)

10.7.1 DESCRIPTION AND ACTIVATION

The purpose of the High Dew Point Alarm is to provide the operator an alarm indication should the equipment fail to supply air at its designed pressure dew point. The EMS dew point sensor communicates the pressure dew point reading to the Microprocessor Controller. Should the pressure dew point rise above the alarm set point, the Microprocessor Controller will display the alarm condition on the controller screen.

The following illustrates the method of activating the High Dew Point Alarm feature:

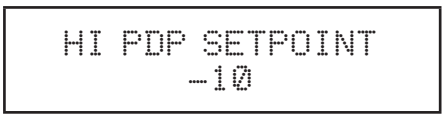
Depress the SELECT DISPLAY button until the HIGH DEW POINT screen is displayed.

Depress the +/- button until the desired set point is displayed. Pressing SELECT DISPLAY saves the current selection.

10.7.2 SETPOINT ADJUSTMENT

On dryers equipped with the optional EMS, the High Dew Point Alarm setpoint can be adjusted.

The following illustrates the method of adjusting the setpoint for the High Dew Point Alarm feature:



Depress the SELECT DISPLAY button until the HIGH DEW POINT ALARM SET POINT screen is displayed.

Pressing the SET button permits the value of the HIGH DEW POINT ALARM SET POINT to be changed.

To enter a negative number, depress the +/- button. Otherwise, proceed to the next step.

Use the numbers on the keypad to enter the desired pressure dew point temperature for the HIGH DEW POINT ALARM setpoint.

Use the numbers on the keypad to enter the desired pressure dew point temperature for the HIGH DEW POINT ALARM setpoint.

Depressing ENTER saves the selected set point.

⚠ NOTICE

The High Dew Point Alarm set point should not be greater than the Energy Management System set point or the dew point adjuster setting. Failure to do so will result in an alarm indication. Ingersoll Rand recommends setting the High Dew Point Alarm at least 10°F wetter than the Energy Management System or dew point adjuster setpoints.

⚠ NOTICE

To exit the TECHNICIAN MODE, press the "+ / -" key to the initial "SETOPMODE" screen and depress the ⇦ button to return to the CUSTOMER MODE.

Ingersoll Rand desiccant dryers are capable of remote communications via MODBUS. Refer to the document entitled, "Microprocessor Control Modbus Communications Guide" for details on communicating with the Controller via MODBUS.

11.1 SCHEDULED MAINTENANCE

DAILY MAINTENANCE FUNCTIONS:

- Check and record inlet pressure, temperature and flow. Verify that it is within specifications.
- Check tower pressure gauge readings within operating tolerance.
- Check operation for proper dryer cycling, depressurization and repressurization.
- Check that the pre-filter drain is operating properly and that there is no condensate discharged from purge mufflers. Replace cartridges sooner if necessary as required by differential pressure indicator.
- Verify that pressure in purging tower is 10 PSIG or less. If higher, muffler replacement is recommended. (Section 11.4)
- Verify that pre-filter and post-filter differential pressure is within operating limits. Change as required. (Section 11.2). Replace cartridges sooner if necessary as required by differential pressure indicator.
- Check the Blue Moisture Indicator. Make sure air is bleeding through the indicator. The indicator will be blue when air is dry.

SEMI-ANNUAL MAINTENANCE FUNCTIONS:

- Check outlet dew point.
- Check pilot air filter element and clean or replace as required.
- Replace pre-filter and post-filter elements and / or cartridges. Replace cartridges sooner if necessary as required by differential pressure indicator.

ANNUAL MAINTENANCE FUNCTIONS:

- Check desiccant and replace if necessary.
- Inspect and clean pilot air control no-loss drain valves, check valves and diaphragm valves. Rebuild and / or replace as required.
- Test lights and switches, replace as necessary.
- Test electrical components, replace as necessary.

EVERY TWO YEARS:

- Replace diaphragm and seal kits on purge and switching diaphragm valves.

EVERY THREE - TO - FIVE YEARS:

- Replace desiccant.
- Rebuild purge and switching diaphragm valves (Preventative)
- Replace Check Valves (Preventative)

11.2 PRE-FILTERS AND POST-FILTERS

- Pre-filters - The cartridges of the pre-filter must be changed as often as required to prevent contamination of the regenerative dryer's desiccant bed.

The pre-filter and automatic drain must be checked daily. To prolong filter cartridge life, it is recommended that a mechanical air / moisture separator be placed immediately before the pre-filter.

⚠ NOTICE

Should the drying system be overloaded and/or malfunctioning, causing high pressure drop, post-filters will prematurely plug. This problem can be avoided by frequent inspection and proactive replacement of cartridges.

- Post-filters - The purpose of the post-filter is to remove residual desiccant dust. Depending upon equipment application and usage, frequency of filter element change will vary. It is recommended to change filter element every six months as a minimum.

⚠ WARNING

To avoid injury, depressurize dryer before performing any service.

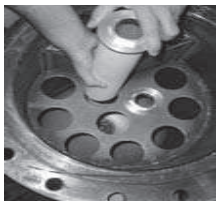
11.2.1 THREADED FILTERS:

Refer to "F35 - F2378 (G, H, A, D) Operators Manual" (CCN 85566024) for element change-out procedures for threaded filters.

11.2.2 FLANGED FILTERS:

STEP 1 - Using a 2" socket with an extension, carefully loosen element.

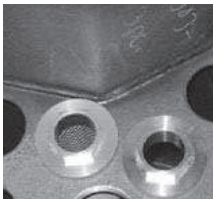
STEP 2 - Remove old element from filter housing.



STEP 3 - Install new element by carefully inserting element in top plate.

STEP 4 - Hand tighten element in place until element o-ring contacts top plate.

STEP 5 - Using a 2" socket with an extension, tighten element one half turn. DO NOT OVER-TIGHTEN.



STEP 6 - Repeat procedure as required to replace all elements.

11.3 PILOT AIR CONTROL NO-LOSS DRAIN VALVES

The length of time the pilot air valves can reliably operate without replacing is dependent upon the type of dryer and the dryer's operation. On **Ingersoll Rand** -40°F dew point dryers, replacing the valves is recommended every 60 months. Given the difference in cycle times for -100°F units, these dryers should have their pilot valves replaced every 30 months.

11.4 MUFFLER CHANGEOUT PROCEDURE

⚠ WARNING

To avoid injury, depressurize dryer before performing any service.

- Depressurize the dryer turn control power off.
- Replace muffler.
- Follow Start-up procedure described in Section 9.7.
- Turn control power back on.

11.5 PURGE AND SWITCHING DIAPHRAGM VALVES (HL90 - HL 2700)

These valves have two control ports; one on top and the other on the back side.

- Normally Open (N.O.) Valves: For N.O. inlet or repressurization valves, control air is supplied to the top port. The back side port exhausts out the bottom side of the diaphragm. If air leaks continuously when control air is supplied to the valve, the internal seals are leaking and must be replaced.
- Normally Closed (N.C.) Valves: For N.C. purge valves, the top port is plugged. Control air is supplied to the back port. If air vents out of the back port continuously when the solenoid is de-energized, it will exhaust through the top of the solenoid. If this condition is observed, the internal seals are leaking and must be replaced.

11.6 PILOT OPERATED ACTUATOR (HL3300 - HL5000)

Should the actuator fail to rotate, disconnect the pilot lines to check if the actuator is receiving pilot pressure.

If the actuator is receiving pressure:

- Verify that control pressure is 75 psig min.
- Ensure the inlet valve is not plugged.

11.7 OUTLET CHECK VALVES

Outlet check valves sealing can be verified by depressurizing the dryer and slowly applying pressure to the outlet. The valves should seal and prevent air from pressurizing the towers. If a tower begins to pressurize, the check valve on that side requires replacement.

11.8 DESICCANT CHANGEOUT PROCEDURE

When it becomes necessary to replace the desiccant in the towers, observe the following procedure:

⚠ WARNING

To avoid injury, depressurize dryer before performing any service.

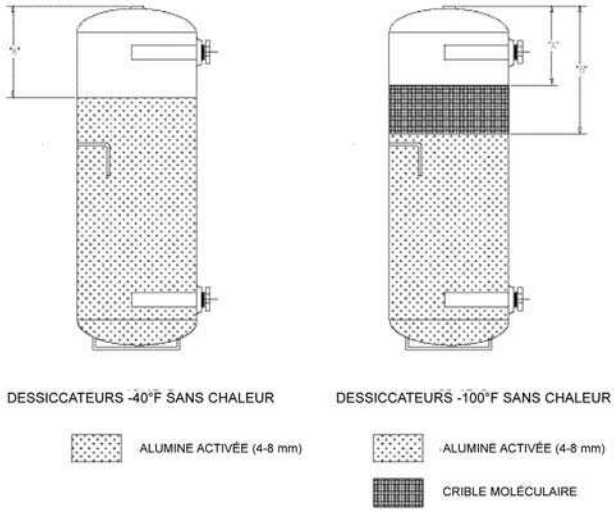
⚠ CAUTION

Be sure to wear respiratory protection during the draining and filling process to minimize inhalation of desiccant, as desiccant will produce dust during this procedure.

⚠ NOTICE

Each dryer is shipped with a desiccant sample kit to allow the desiccant to be sent for analysis. This kit can be used to have the condition of the desiccant verified by laboratory analysis. Please follow the instructions found in the kit.

- The standard units are furnished with fill and drain ports on each desiccant tower. Remove the caps on both ports.
- To assist in getting the desiccant to flow from the tower, insert a small rod in to the drain port as necessary. This may be required as the desiccant is packed into the towers which may interfere with the desiccant flow from the towers.
- Retainer screens, located at the inlet and outlet piping connections of the tower, are removable on all models. It is suggested that these screens be removed and cleaned at the time of desiccant changeout. These screens can be accessed by disconnecting the upper and lower manifolds from the dryer towers.
- After cleaning the retainer screens, replace screens and reattach the outlet port plug.
- With the fill port plug removed, fill the dryer tower with the appropriate grade and size desiccant. The level of the desiccant should be below the top retainer screen as shown on the Desiccant Fill Chart below.
- Once the towers have been filled, replace the fill port plug on each tower.
- Any connections disturbed in the desiccant changeout process should be leak tested prior to re-commissioning the dryer.



Model No.	A	B
HL90	20″	30″
HL120	7″	20.38″
HL160	18″	29.75″
HL200	7″	21.50″
HL250	16″	28″
HL300	7″	21.25″
HL400	8″	22.25″
HL500	20″	34.75″
HL600	10″	27.50″
HL800	27″	41″

Model No.	A	B
HL1000	14.5″	31.5″
HL1200	4″	23.75″
HL1500	6″	23.25″
HL1800	31.50″	45.75″
HL2100	22″	38.5″
HL2700	6″	26″
HL3300	16.25″	5.25″
HL4000	7.75″	29″
HL5000	9″	28″
Tolerance = +/- .50″		

DESICCANT FILL CHART

MODEL No.	LB. AA -40°C DRYERS	LB. AA -100°C DRYERS	LB. MS -100°C DRYERS
HL90	100	75	25
HL120	134	101	34
HL160	192	144	48
HL200	236	177	59
HL250	290	218	73
HL300	344	258	86
HL400	470	353	118
HL500	638	479	160
HL600	748	561	187
HL800	900	675	225
HL1000	1100	825	275
HL1200	1270	953	318
HL1500	1600	1200	400
HL1800	2000	1500	500
HL2100	2340	1755	585
HL2700	2928	2196	732
HL3300	3800	2850	950
HL4000	4226	3200	1026
HL5000	5138	3850	1288

AA = ACTIVATED ALUMINA
MS = MOLECULAR SIEVE

NOTE: Qty. is per dryer

DESCRIPTION	PART #
ACTIVATED ALUMINA QTY. (1) 50 LB. BAG	38004834
ACTIVATED ALUMINA QTY. (42) 50 LB. BAGS	38004933
ACTIVATED ALUMINA QTY. (1) 2000 LB. SACK	38340659
MOLECULAR SIEVE QTY. (1) 275 LB. DRUM	38449971

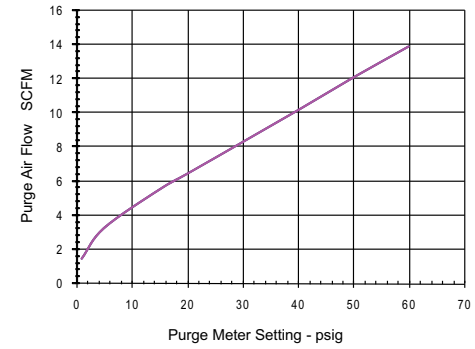
12.0 TROUBLESHOOTING

Refer to maintenance descriptions in Section 11as required for trouble shooting procedures.

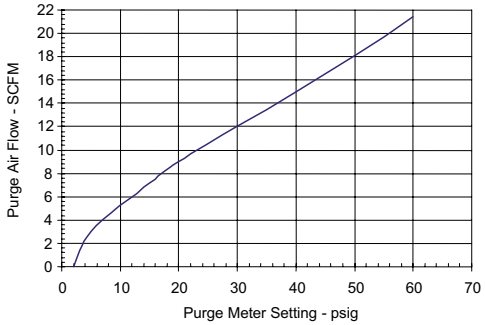
PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Elevated dew point	Insufficient purge rate	Check purge flow settings. Check purge piping for obstruction. Clean purge piping and muffler.
	Inlet air pressure below design condition.	Check pressure source and system for leakage.
	Flow rate higher than design condition.	Check flow rate and cause for increased demand. Correct flow rate condition.
	Inlet temperature above design condition (120°F).	Check aftercooler, clean and service as necessary.
	Entrained water entering desiccant bed.	Check air/moisture separator and pre-filter. Replace dryer desiccant if necessary.
	Desiccant contaminated by oil.	Install suitable pre-filter. Replace dryer desiccant.
Blue Moisture Indicator (BMI) indicates high moisture level.	Elevated dew point	Refer to "Elevated Dew Point" corrective actions above.
	BMI wet	Depending on degree of saturation of the desiccant, the BMI may take a week or more of continuous use to switch back to its blue (dry) state.
Excessive pressure drop in dryer	Excessive flow rate.	Check flow rate and cause for increased air demand.
	Inlet pressure below design condition**.**	Check pressure source.
Failure to Shift (Switching Failure)	No input power	Check power input.
	Defective solenoid valve	Check solenoid valve.
	No pilot air	Check pilot air line. Check that control air line filter is clean.
	Pilot-operated diaphragm valve seal failure	Inspect and replace seals as required.
Dryer fails to pressurize.	Faulty purge valve	Check that repressurization circuit is sending control signal.
		Check purge valve and its solenoid valve.
Dryer depressurizes too rapidly.	Purge valve does not close; dryer repressurizing through inlet valve.	Check purge valve and its solenoid valve.
Dryer fails to purge.	Purge valve does not open. Purge valve stuck in closed position.	Check purge valve and its solenoid valve. Repair and replace if necessary.
		Check that repressurization circuit is sending control signal.
Excessive back pressure in regenerating tower (above 5 psig)	Purge muffler does not pass air.	Purge muffler is dirty; replace.
	Purge muffler passes too much air. Air is leaking across valve.	Check inlet valve and outlet check valves. Verify inlet valve is closed to purging tower (0 psig tower).
Right tower excessively high pressure at the purge gauge.	Improper calibration.	Reset when right tower is on line.

13.0 PURGE CHARTS

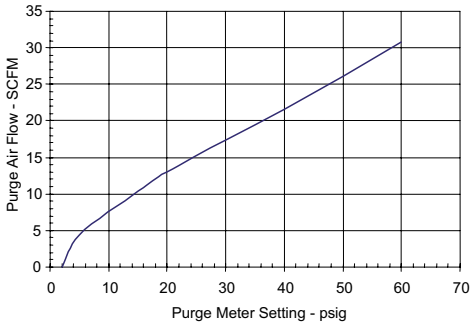
Purge Orifice - 9/64"
HL90 Setting - 65 psig @ 14 SCFM



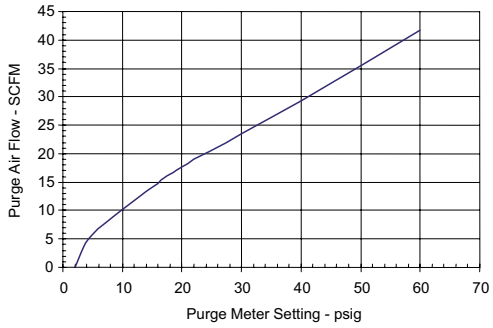
Purge Orifice - 5/32"
HL120 Setting - 53 psig @ 19 SCFM



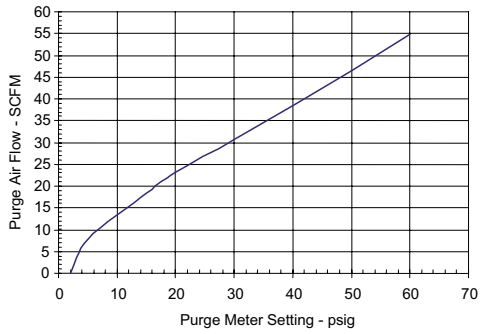
Purge Orifice - 3/16"
HL160 Setting - 50 psig @ 26 SCFM



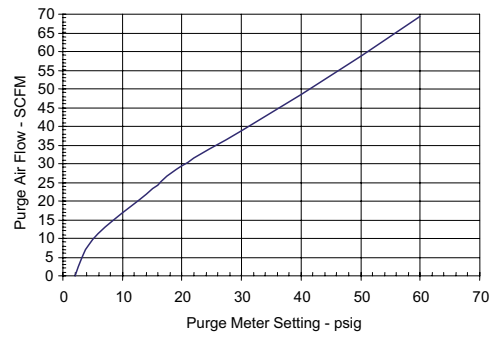
Purge Orifice - 7/32"
HL200 Setting - 42 psig @ 30 SCFM



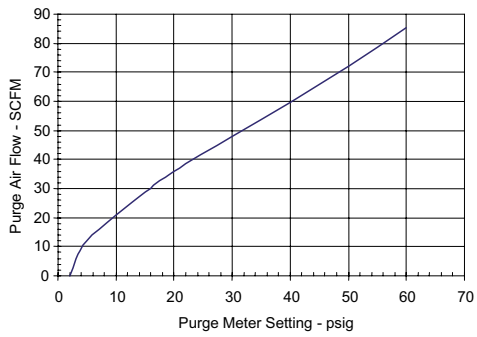
Purge Orifice - 1/4"
HL250 Setting - 42 psig @ 40 SCFM



Purge Orifice - 9/32"
HL300 Setting - 40 psig @ 48 SCFM

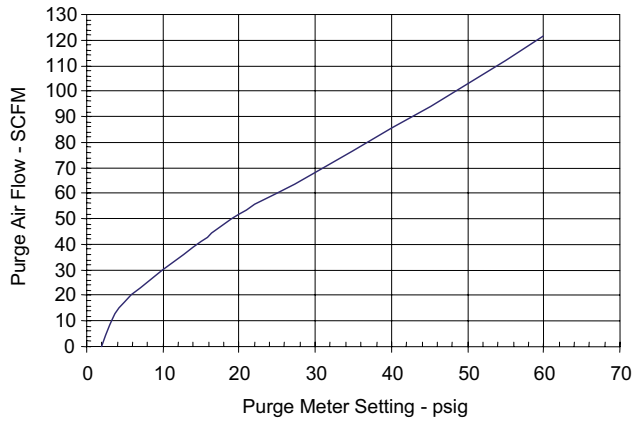


Purge Orifice - 5/16"
HL400 Setting - 45 psig @ 65 SCFM

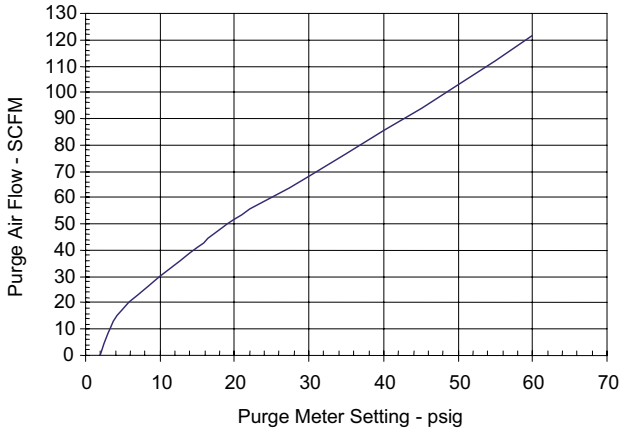


13.0 PURGE CHARTS

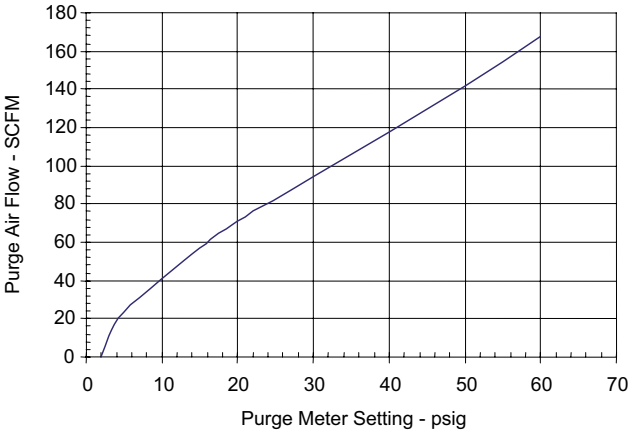
Purge Orifice - 3/8"
HL500 Setting - 35 psig @ 81 SCFM



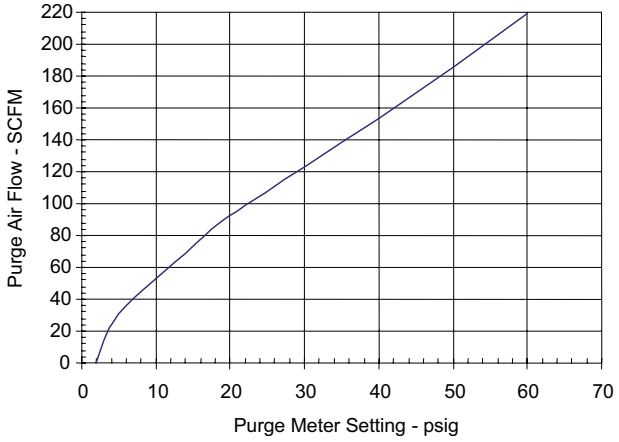
Purge Orifice - 3/8"
HL600 Setting - 41 psig @ 93 SCFM



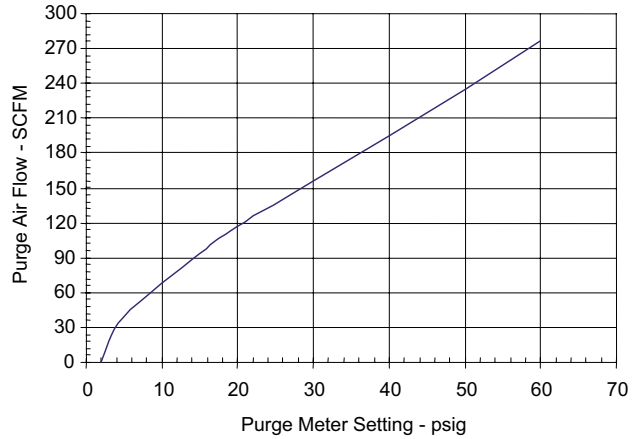
Purge Orifice - 7/16"
HL800 Setting - 46 psig @ 130 SCFM



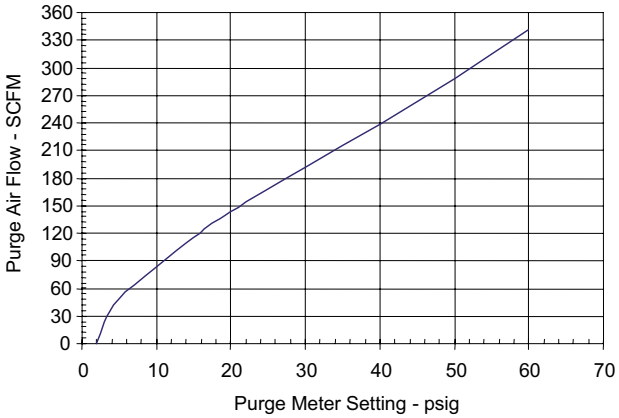
Purge Orifice - 1/2"
HL1000 Setting - 43 psig @ 162 SCFM



Purge Orifice - 9/16"
HL1200 Setting - 41 psig @ 195 SCFM

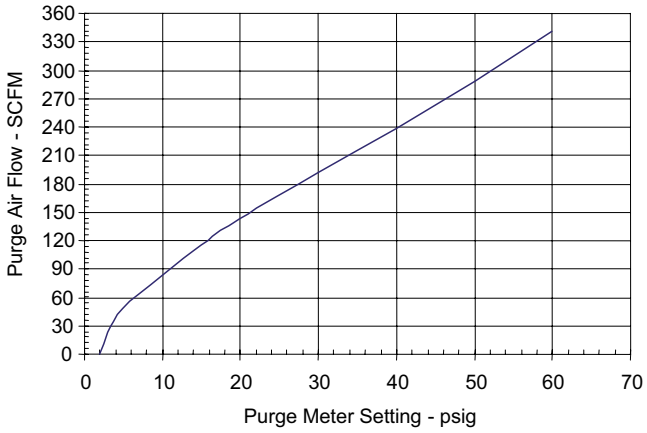


Purge Orifice - 5/8"
HL1500 Setting - 41 psig @ 243 SCFM

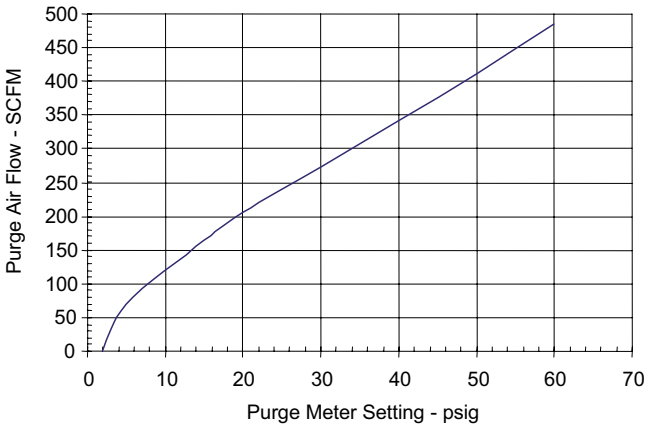


13.0 PURGE CHARTS

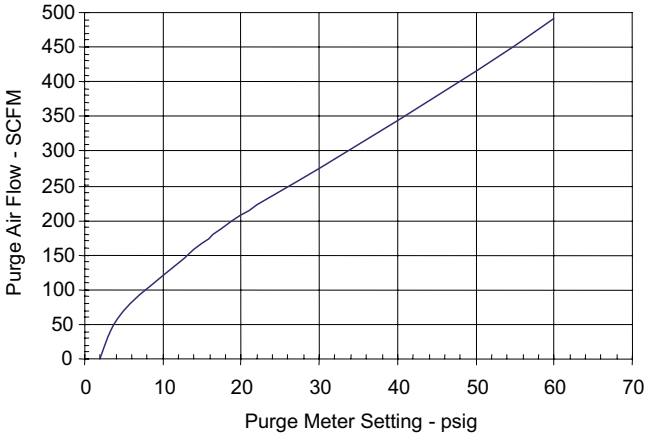
Purge Orifice - 5/8"
HL1800 Setting - 51 psig @ 292 SCFM



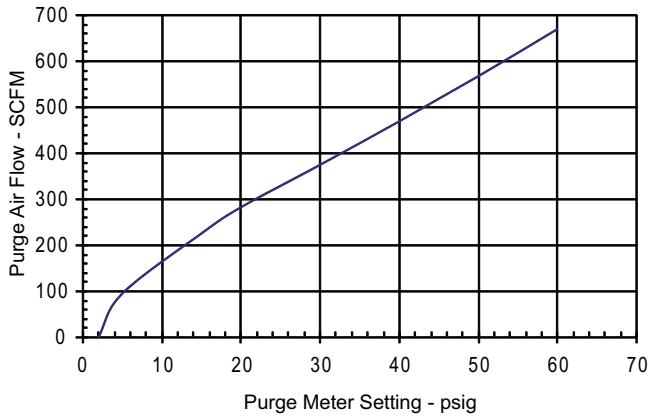
Purge Orifice - 3/4"
HL2100 Setting - 40 psig @ 340 SCFM



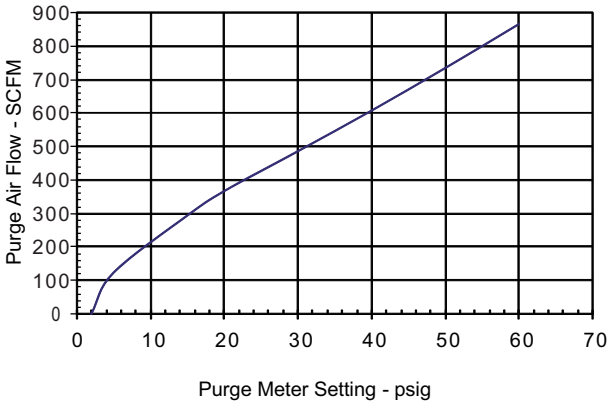
Purge Orifice - 3/4"
HL2700 Setting - 53 psig @ 438 SCFM



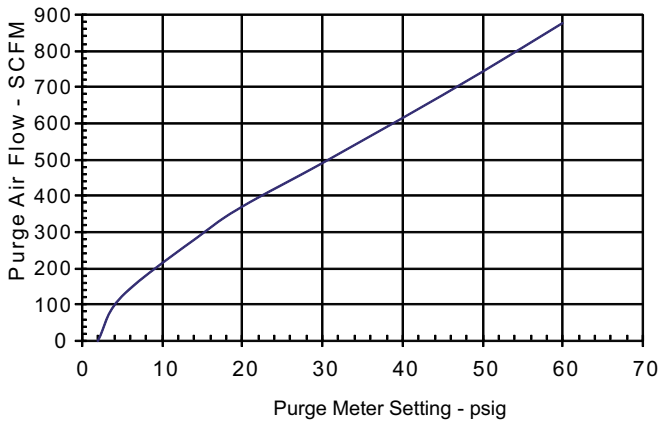
Purge Orifice7/8"
HL3300 Setting - 47 psig @ 535 SCFM

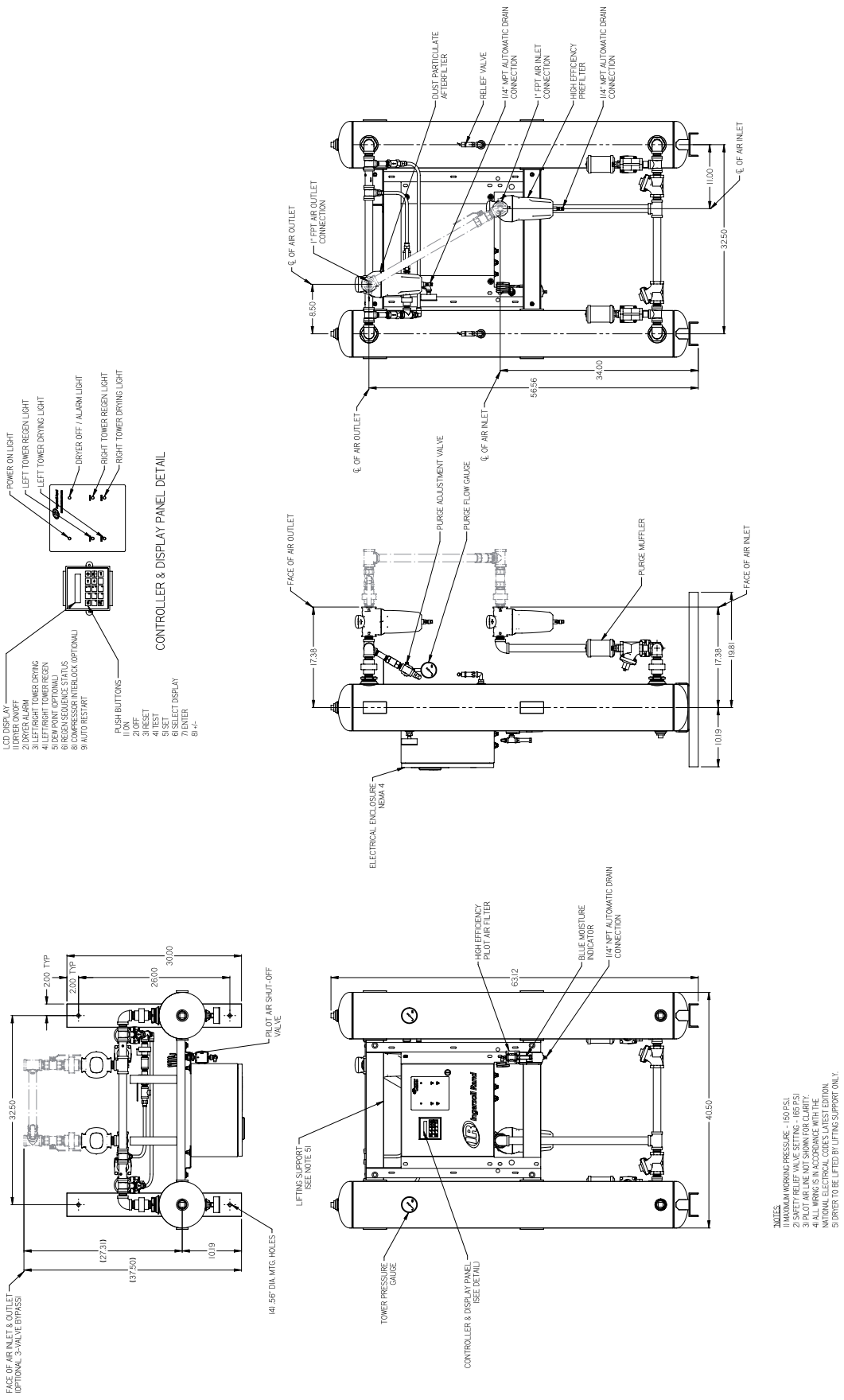


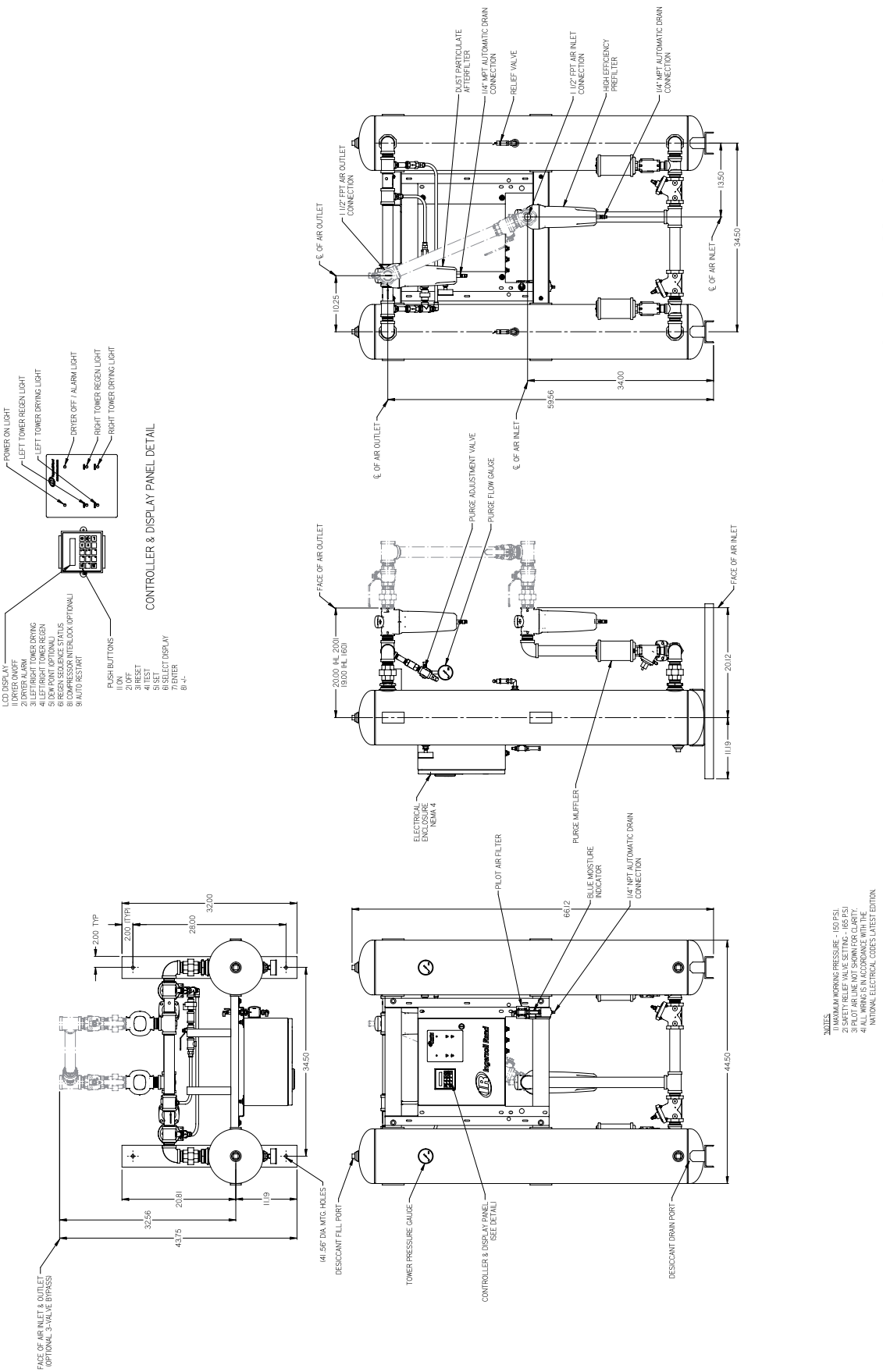
Purge Orifice - 1"
HL4000 Setting - 44 psig @ 649 SCFM



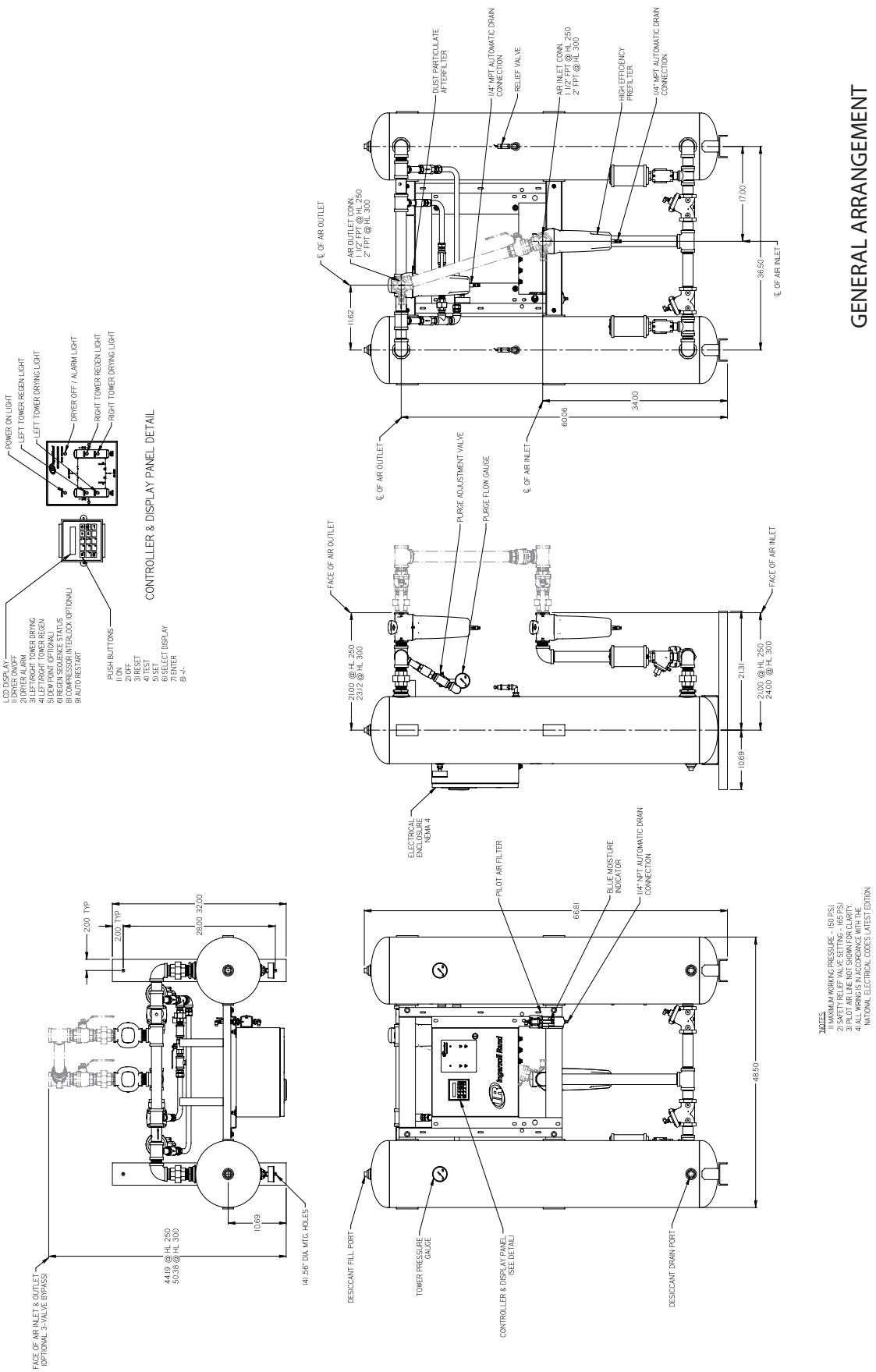
Purge Orifice - 1"
HL5000 Setting - 56 psig @ 811 SCFM

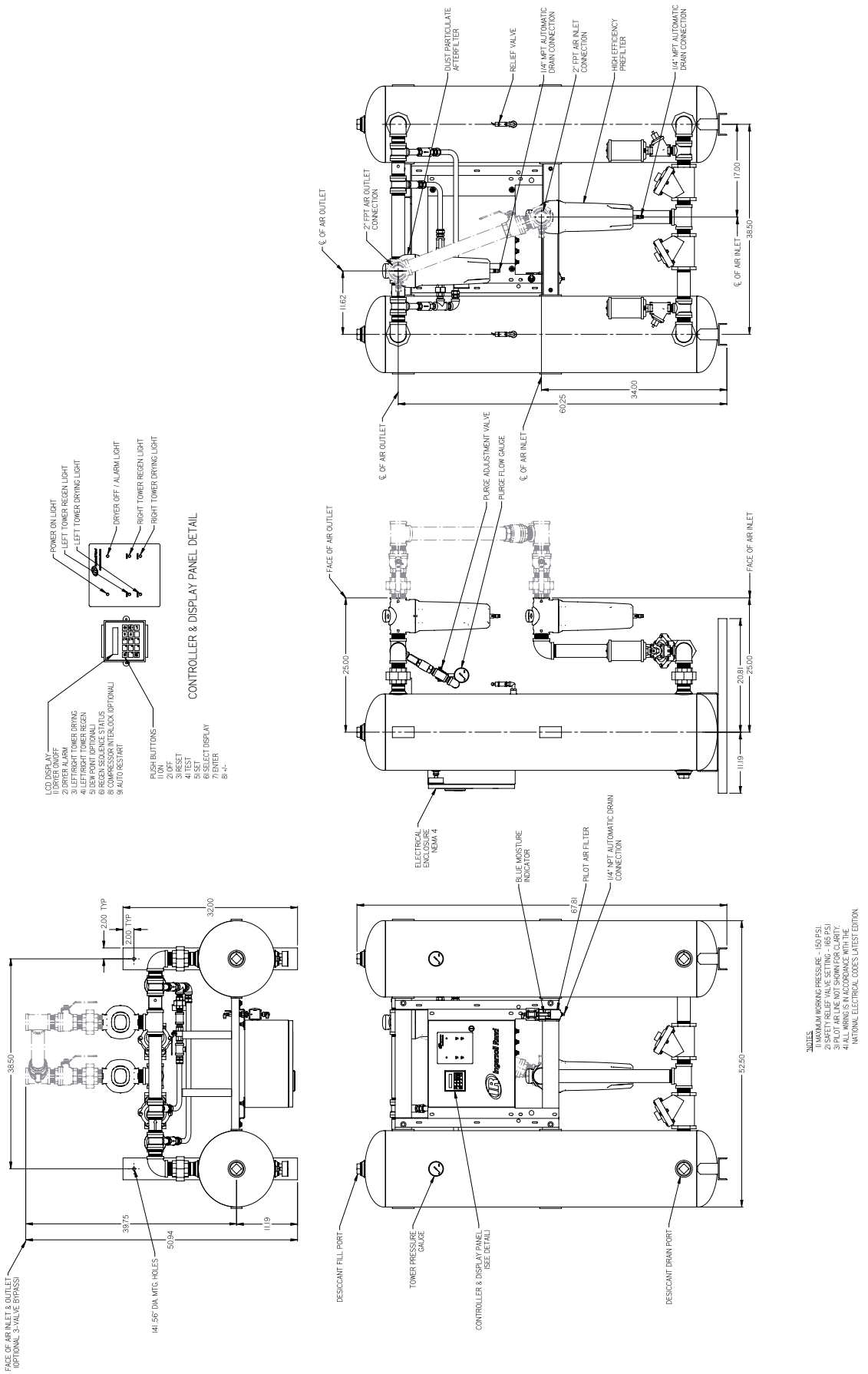



GENERAL ARRANGEMENT
HL90-HL120
580000-G
DUST PARTICULATE AFTERFILTER
RELIEF VALVE
1/4" MPT AUTOMATIC DRAIN CONNECTION
1" FPT AIR INLET CONNECTION
HIGH EFFICIENCY PREFILTER
1/4" MPT AUTOMATIC DRAIN CONNECTION
℄ OF AIR OUTLET
1" FPT AIR OUTLET CONNECTION
℄ OF AIR INLET
11.00
32.50
8.50
34.00
56.56
PURGE ADJUSTMENT VALVE
PURGE FLOW GAUGE
PURGE MUFFLER
FACE OF AIR OUTLET
FACE OF AIR INLET
17.38
19.81
10.19
ELECTRICAL ENCLOSURE NEMA 4
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) POWER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
HIGH EFFICIENCY PILOT AIR FILTER
BLUE MOISTURE INDICATOR
1/4" NPT AUTOMATIC DRAIN CONNECTION
63.12
40.50
LIFTING SUPPORT (SEE NOTE 5)
TOWER PRESSURE GAUGE
CONTROLLER & DISPLAY PANEL (SEE DETAIL)
2.00 TYP
2.50 TYP
26.00
30.00
PILOT AIR SHUT-OFF VALVE
32.50
(27.31)
(37.50)
10.19
(4) .56" DIA. MTG. HOLES
FACE OF AIR INLET & OUTLET (OPTIONAL 3-VALVE BYPASS)
NOTES
1) MAXIMUM WORKING PRESSURE - 150 PSI.
2) SAFETY RELIEF VALVE SETTING - 165 PSI.
3) PILOT AIR MUST BE OIL FREE (DRY AIR).
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE'S LATEST EDITION.
5) DRYER TO BE LIFTED BY LIFTING SUPPORT ONLY.

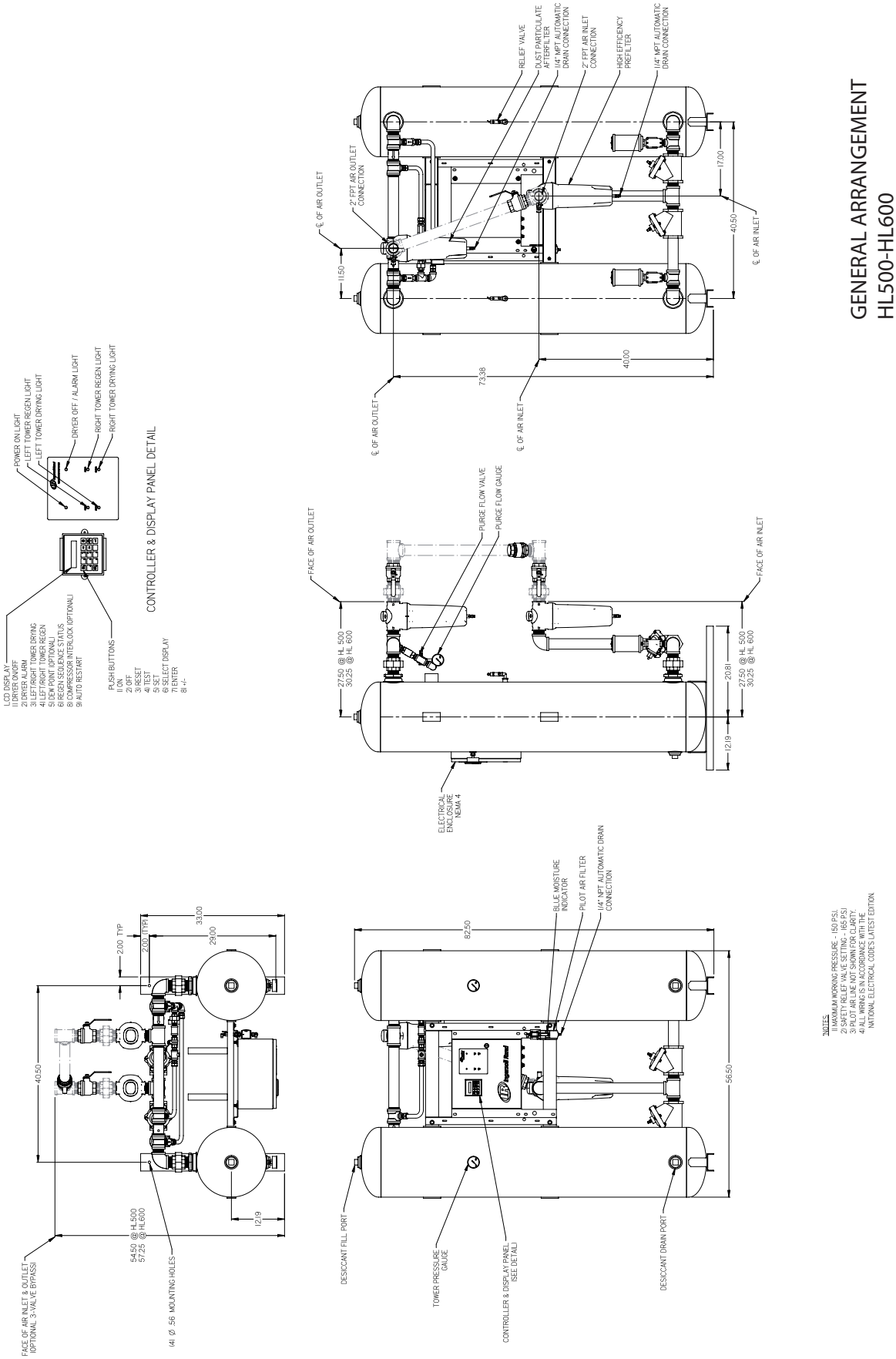


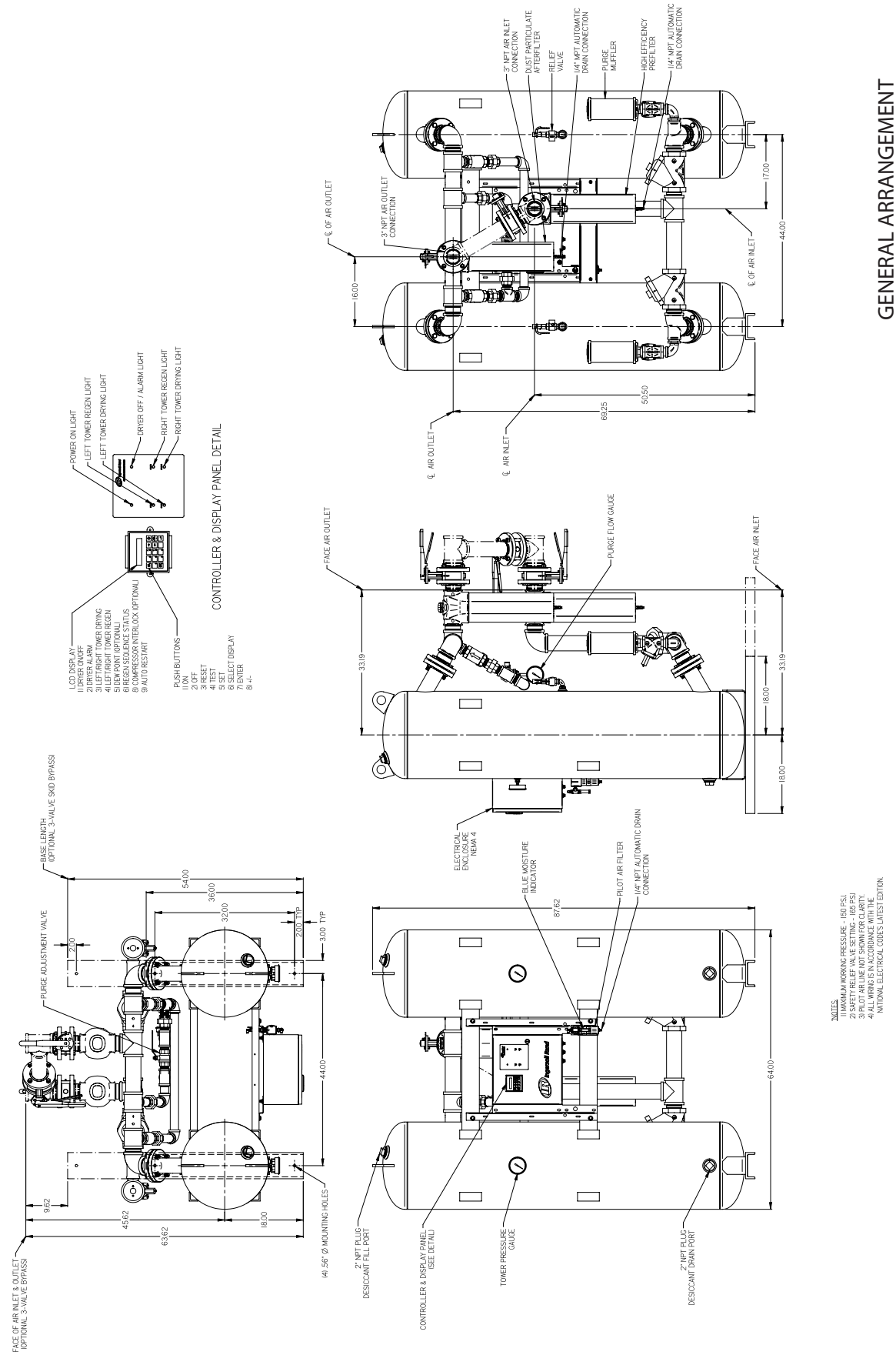
GENERAL ARRANGEMENT
HL160-HL200
580001-E

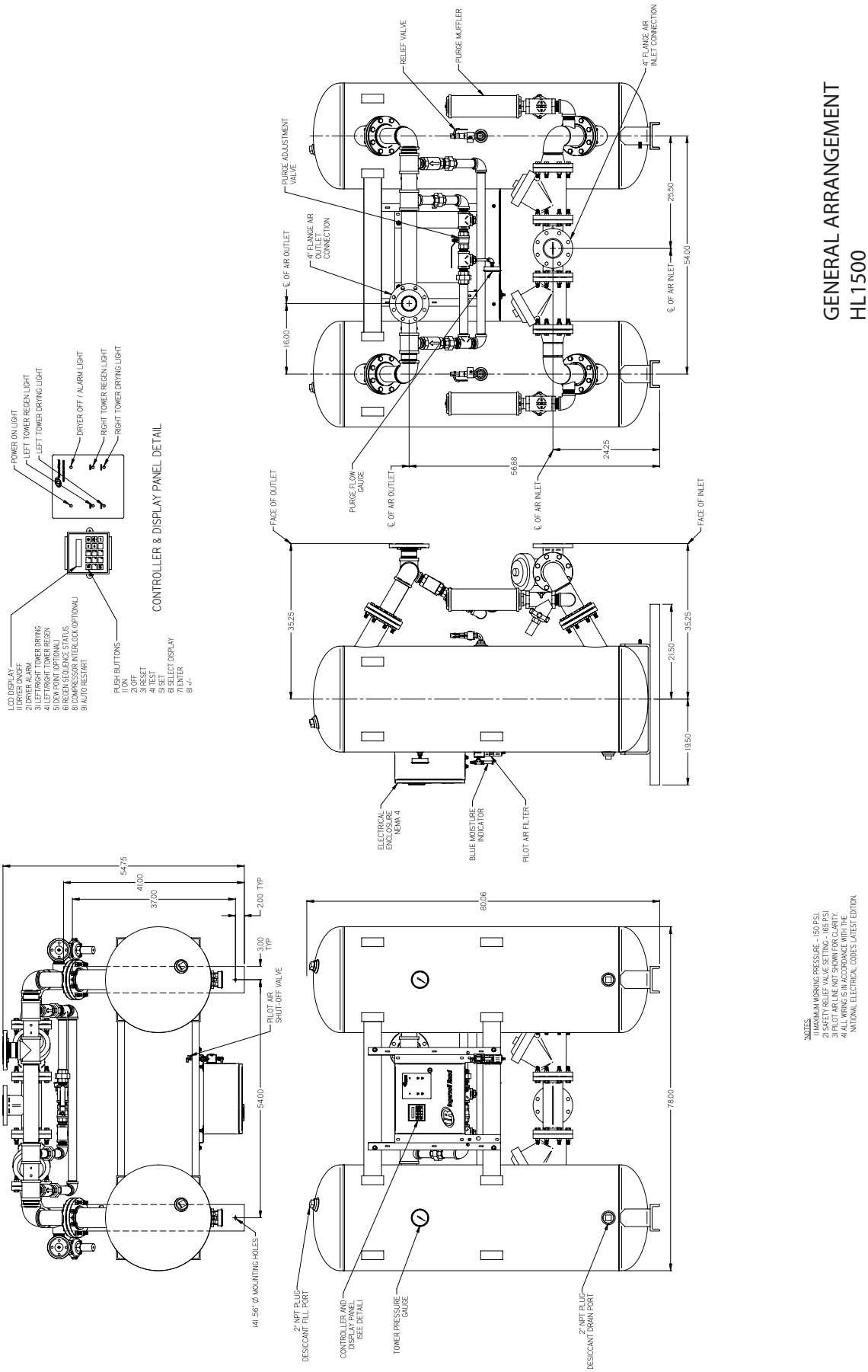

GENERAL ARRANGEMENT
HL250-HL300
580002-F
DUST PARTICULATE AFTERFILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
RELIEF VALVE
AIR INLET CONN. 1 1/2" FPT @ HL 250 2" FPT @ HL 300
HIGH EFFICIENCY PREFILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
AIR OUTLET CONN. 1 1/2" FPT @ HL 250 2" FPT @ HL 300
℄ OF AIR OUTLET
11.62
17.00
36.50
℄ OF AIR INLET
34.00
60.06
℄ OF AIR OUTLET
℄ OF AIR INLET
FACE OF AIR OUTLET
PURGE ADJUSTMENT VALVE
PURGE FLOW GAUGE
FACE OF AIR INLET
2100 @ HL 250
2312 @ HL 300
21.31
2100 @ HL 250
2400 @ HL 300
10.69
ELECTRICAL ENCLOSURE NEMA 4
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) DRYER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) POWER ON/OFF CONTROL
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
2.00 TYP
2.00 TYP
28.00
32.00
10.69
44.19 @ HL 250
50.38 @ HL 300
41.56" DIA. MTG. HOLES
FACE OF AIR INLET & OUTLET (OPTIONAL 3-VALVE BYPASS)
PILOT AIR FILTER
BLUE MOISTURE INDICATOR
1/4" NPT AUTOMATIC DRAIN CONNECTION
66.81
48.50
DESICCANT FILL PORT
TOWER PRESSURE GAUGE
CONTROLLER & DISPLAY PANEL (SEE DETAIL)
DESICCANT DRAIN PORT
NOTES:
1) MAXIMUM WORKING PRESSURE - 150 PSI.
2) SAFETY RELIEF VALVE SETTING - 165 PSI.
3) PILOT AIR LINE (NOT SHOWN FOR CLARITY).
4) ALL WIRING SHALL CONFORM WITH THE NATIONAL ELECTRICAL CODE'S LATEST EDITION.

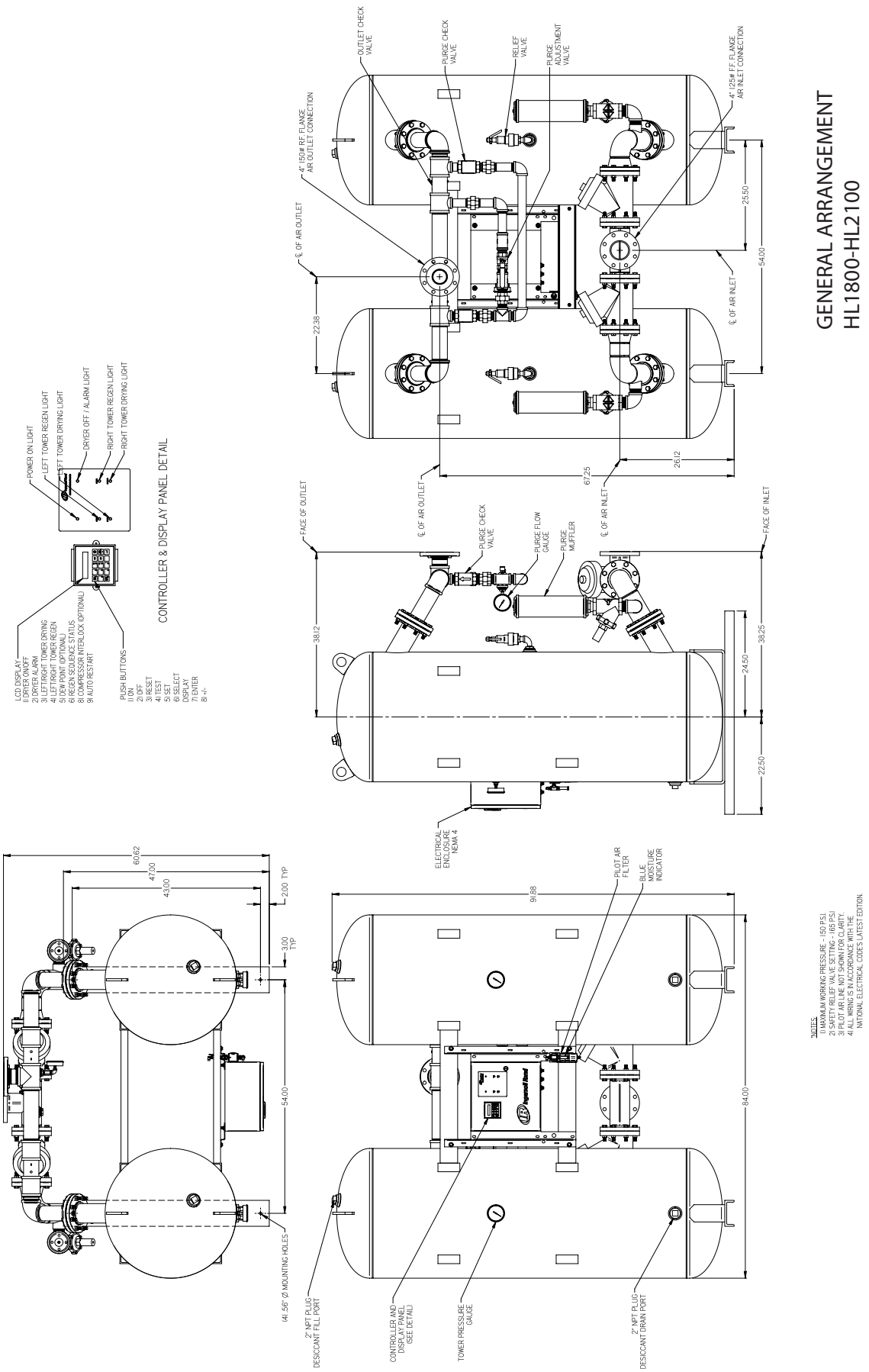


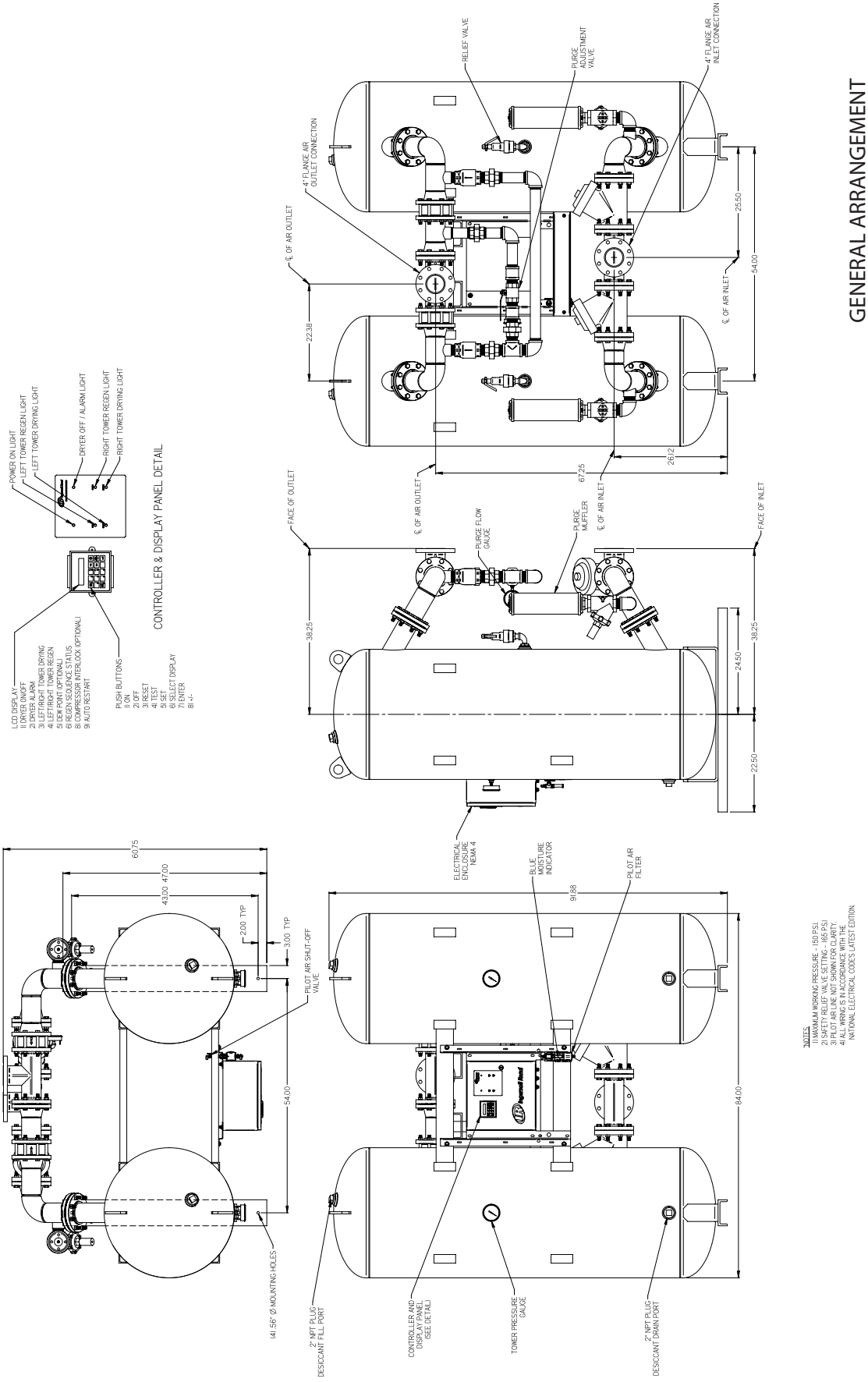
GENERAL ARRANGEMENT
HL400
580003-E

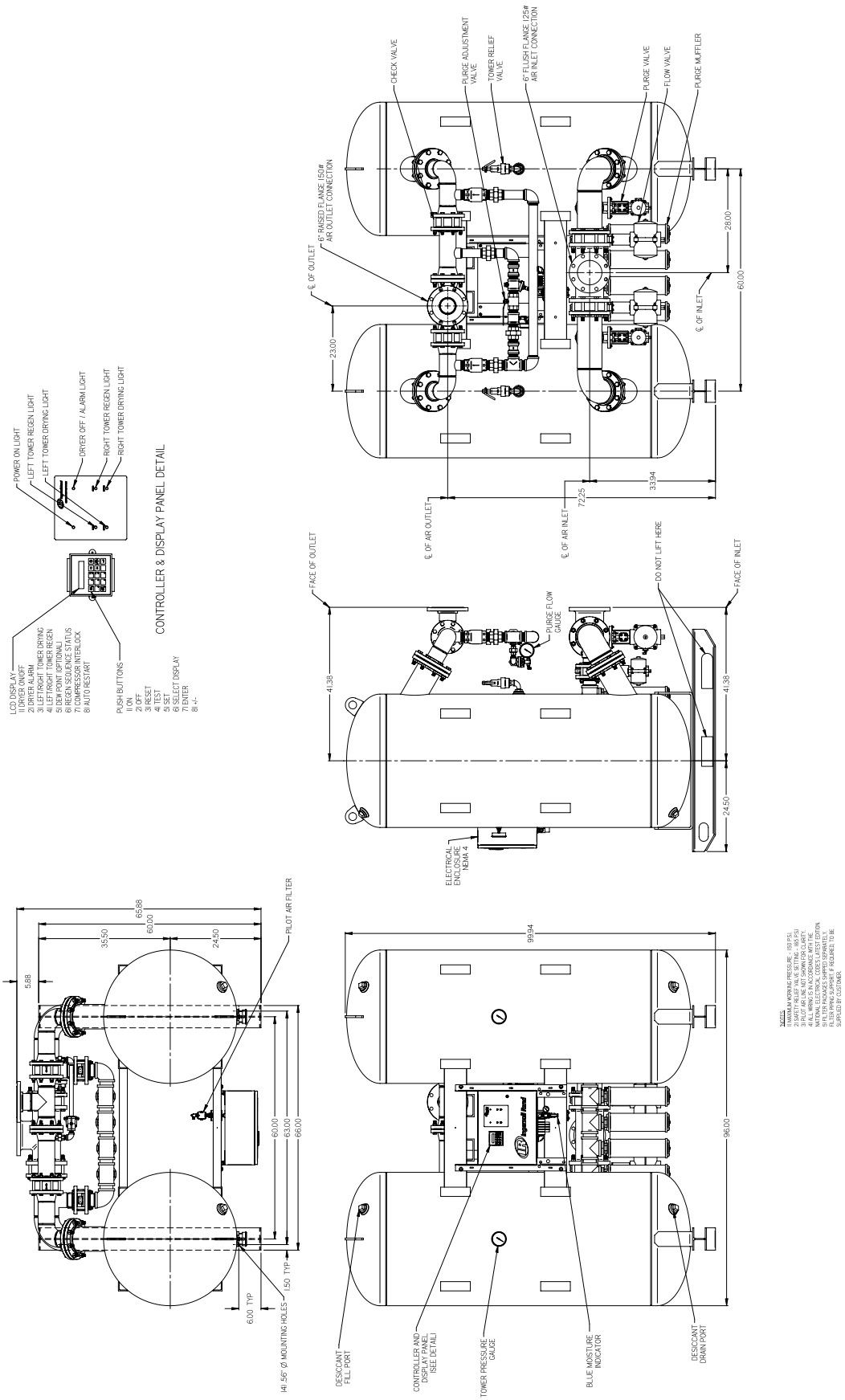

GENERAL ARRANGEMENT
HL500-HL600
580004-E
RELIEF VALVE
DUST PARTICULATE AFTERFILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
2" FPT AIR INLET CONNECTION
HIGH EFFICIENCY PREFILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
2" FPT AIR OUTLET CONNECTION
℄ OF AIR OUTLET
℄ OF AIR INLET
11.50
17.00
40.50
40.00
73.38
PURGE FLOW VALVE
PURGE FLOW GAUGE
FACE OF AIR OUTLET
FACE OF AIR INLET
27.50 @ HL 500
30.25 @ HL 600
20.81
12.19
ELECTRICAL ENCLOSURE NEMA 4
BLUE MOISTURE INDICATOR
PILOT AIR FILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
82.50
56.50
DESICCANT FILL PORT
TOWER PRESSURE GAUGE
CONTROLLER & DISPLAY PANEL (SEE DETAIL)
DESICCANT DRAIN PORT
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) POWER ON/OFF
2) RESET ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
3300
2900
2.00 TYP
2.00 TYP
40.50
54.50 @ HL500
57.25 @ HL600
12.19
14 Ø .56 MOUNTING HOLES
FACE OF AIR INLET & OUTLET (OPTIONAL 3-VALVE BYPASS)
NOTES:
1) MAXIMUM WORKING PRESSURE - 150 P.S.I.
2) SAFETY (RELIEF VALVE SETTING - 165 P.S.I.
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODES LATEST EDITION.


GENERAL ARRANGEMENT
HL800-HL1200
580005-G
3" NPT AIR INLET CONNECTION
DUST PARTICULATE AFTERFILTER
RELIEF VALVE
1/4" NPT AUTOMATIC DRAIN CONNECTION
PURGE MUFFLER
HIGH EFFICIENCY PREFILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
3" NPT AIR OUTLET CONNECTION
℄ OF AIR OUTLET
℄ OF AIR INLET
16.00
17.00
44.00
50.50
69.25
℄ AIR OUTLET
℄ AIR INLET
FACE AIR OUTLET
PURGE FLOW GAUGE
FACE AIR INLET
33.19
18.00
ELECTRICAL ENCLOSURE NEMA 4
BLUE MOISTURE INDICATOR
PILOT AIR FILTER
1/4" NPT AUTOMATIC DRAIN CONNECTION
87.62
64.00
2" NPT PLUG DESICCANT FILL PORT
CONTROLLER & DISPLAY PANEL (SEE DETAIL)
TOWER PRESSURE GAUGE
2" NPT PLUG DESICCANT DRAIN PORT
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) DRYER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
BASE LENGTH (OPTIONAL 3-VALVE SKID BYPASS)
54.00
36.00
32.00
PURGE ADJUSTMENT VALVE
2.00
2.00 TYP
3.00 TYP
44.00
9.62
45.62
63.62
18.00
4) .56" Ø MOUNTING HOLES
FACE OF AIR INLET & OUTLET (OPTIONAL 3-VALVE BYPASS)
NOTES:
1) MAXIMUM WORKING PRESSURE - 150 PSI.
2) SAFETY RELIEF VALVE SETTING - 165 PSI.
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODES LATEST EDITION.

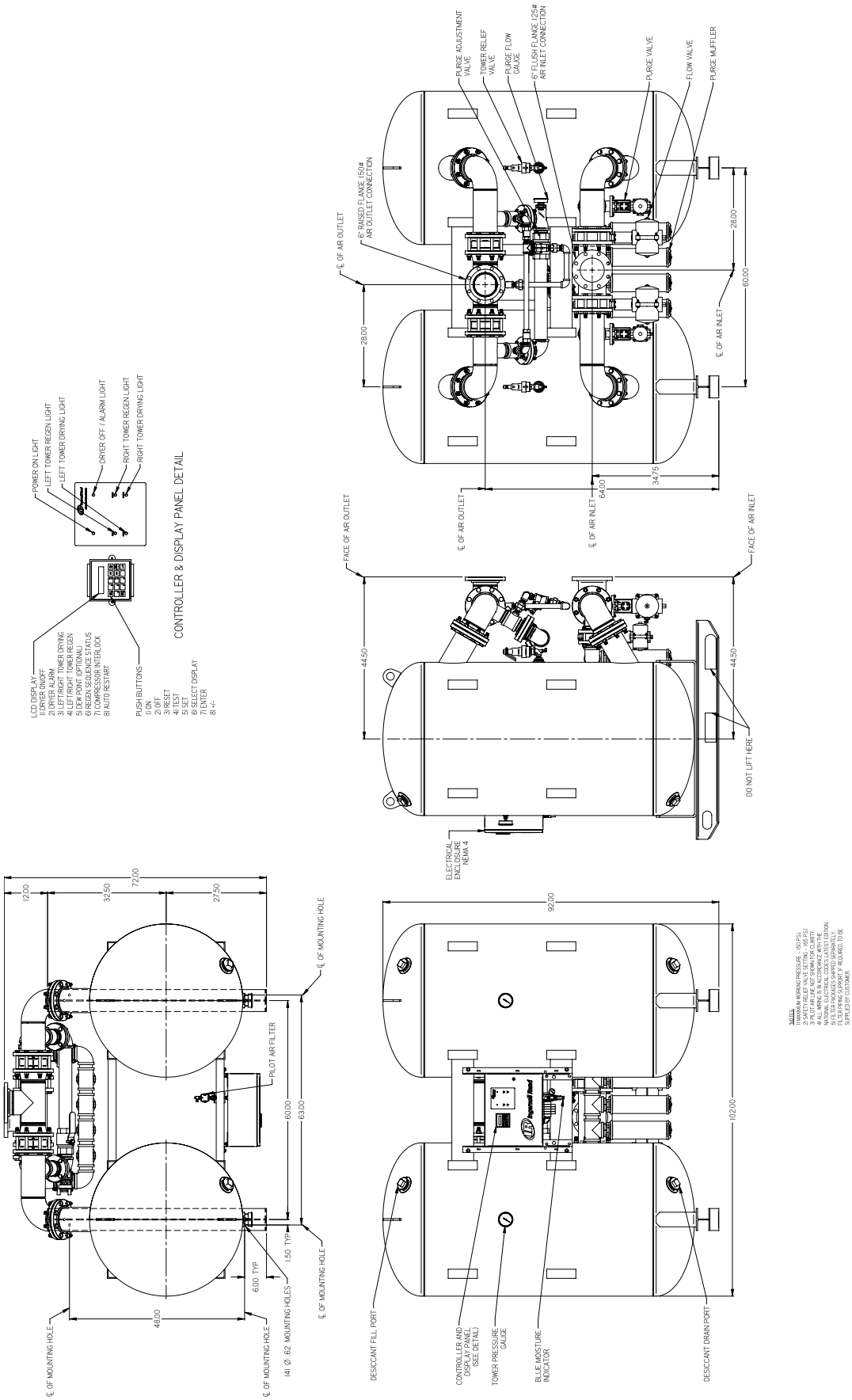

GENERAL ARRANGEMENT
HL1500
580006-F
RELIEF VALVE
PURGE MUFFLER
4" FLANGE AIR INLET CONNECTION
PURGE ADJUSTMENT VALVE
4" FLANGE AIR OUTLET CONNECTION
℄ OF AIR OUTLET
16.00
℄ OF AIR INLET
25.50
54.00
56.88
24.25
PURGE FLOW GAUGE
FACE OF OUTLET
FACE OF INLET
35.25
21.50
19.50
ELECTRICAL ENCLOSURE NEMA 4
BLUE MOISTURE INDICATOR
PILOT AIR FILTER
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) POWER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
54.75
41.00
37.00
2.00 TYP
3.00 TYP
PILOT AIR SHUT-OFF VALVE
54.00
141.56" Ø MOUNTING HOLES
80.06
78.00
2" NPT PLUG DESICCANT FILL PORT
CONTROLLER AND DISPLAY PANEL (SEE DETAIL)
TOWER PRESSURE GAUGE
2" NPT PLUG DESICCANT DRAIN PORT
NOTES
1) MAXIMUM WORKING PRESSURE - 150 P.S.I.
2) SAFETY RELIEF VALVE SETTING - 165 P.S.I.
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODES LATEST EDITION.

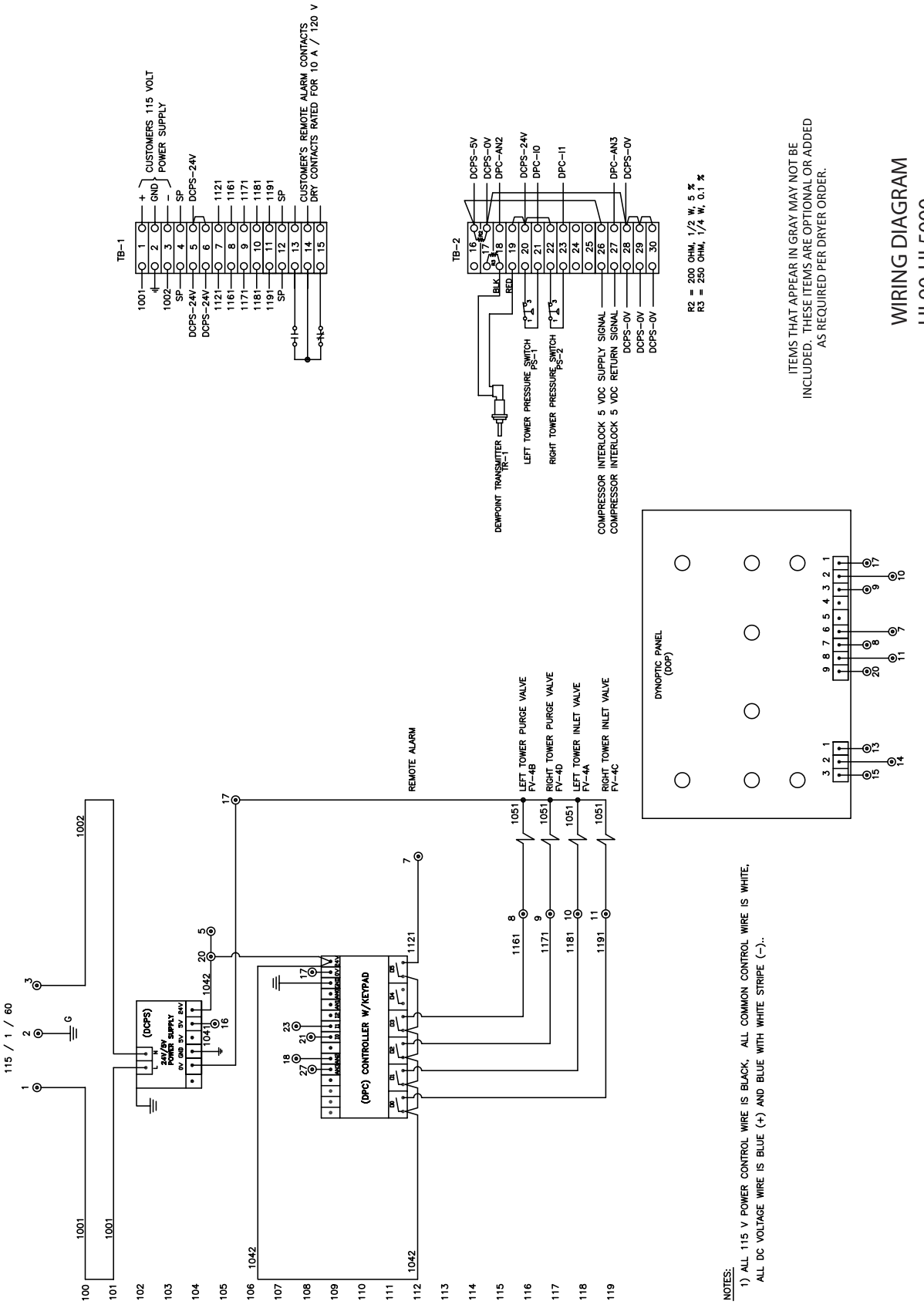

GENERAL ARRANGEMENT
HL1800-HL2100
580029-E
OUTLET CHECK VALVE
PURGE CHECK VALVE
RELIEF VALVE
PURGE ADJUSTMENT VALVE
4" 125# F.F. FLANGE AIR INLET CONNECTION
4" 150# R.F. FLANGE AIR OUTLET CONNECTION
℄ OF AIR OUTLET
℄ OF AIR INLET
22.38
25.50
54.00
67.25
26.12
FACE OF OUTLET
FACE OF INLET
PURGE CHECK VALVE
PURGE FLOW GAUGE
PURGE MUFFLER
38.12
24.50
38.25
22.50
ELECTRICAL ENCLOSURE NEMA 4
91.88
PILOT AIR FILTER
BLUE MOISTURE INDICATOR
84.00
2" NPT PLUG DESICCANT FILL PORT
CONTROLLER AND DISPLAY PANEL (SEE DETAIL)
TOWER PRESSURE GAUGE
2" NPT PLUG DESICCANT DRAIN PORT
60.62
47.00
43.00
2.00 TYP
3.00 TYP
54.00
(4) .56" Ø MOUNTING HOLES
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) DRYER ON/OFF
2) POWER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ▽ DOWN
8) △
NOTES
1) MAXIMUM WORKING PRESSURE - 150 PSI.
2) SAFETY RELIEF VALVE SETTING - 165 PSI.
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE'S LATEST EDITION

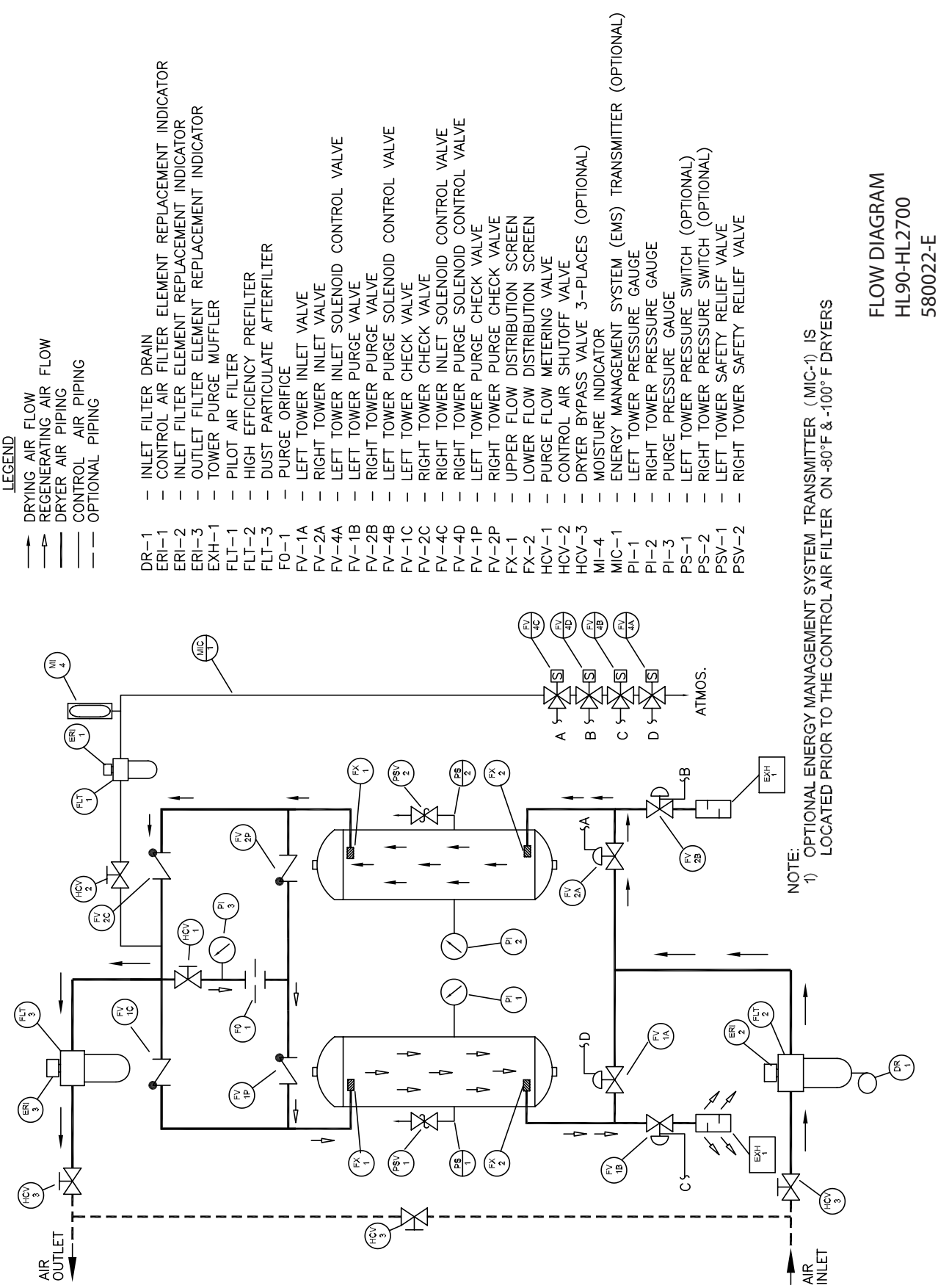

GENERAL ARRANGEMENT
HL2700
580007-F
RELIEF VALVE
PURGE ADJUSTMENT VALVE
4" FLANGE AIR INLET CONNECTION
4" FLANGE AIR OUTLET CONNECTION
℄ OF AIR OUTLET
℄ OF AIR INLET
22.38
25.50
54.00
26.12
67.25
FACE OF OUTLET
FACE OF INLET
PURGE FLOW GAUGE
PURGE MUFFLER
38.25
24.50
22.50
ELECTRICAL ENCLOSURE NEMA 4
BLUE MOISTURE INDICATOR
PILOT AIR FILTER
9.88
84.00
60.75
43.00 47.00
2.00 TYP
3.00 TYP
PILOT AIR SHUT-OFF VALVE
54.00
(4) .56" Ø MOUNTING HOLES
2" NPT PLUG DESICCANT FILL PORT
CONTROLLER AND DISPLAY PANEL (SEE DETAIL)
TOWER PRESSURE GAUGE
2" NPT PLUG DESICCANT DRAIN PORT
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) DRYER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT (OPTIONAL)
6) REGEN SEQUENCE STATUS
8) COMPRESSOR INTERLOCK (OPTIONAL)
9) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
CONTROLLER & DISPLAY PANEL DETAIL
NOTES
1) MAXIMUM WORKING PRESSURE - 150 P.S.I.
2) SAFETY RELIEF VALVE SETTING - 165 P.S.I.
3) PILOT AIR LINE NOT SHOWN FOR CLARITY.
4) ALL WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODES LATEST EDITION.

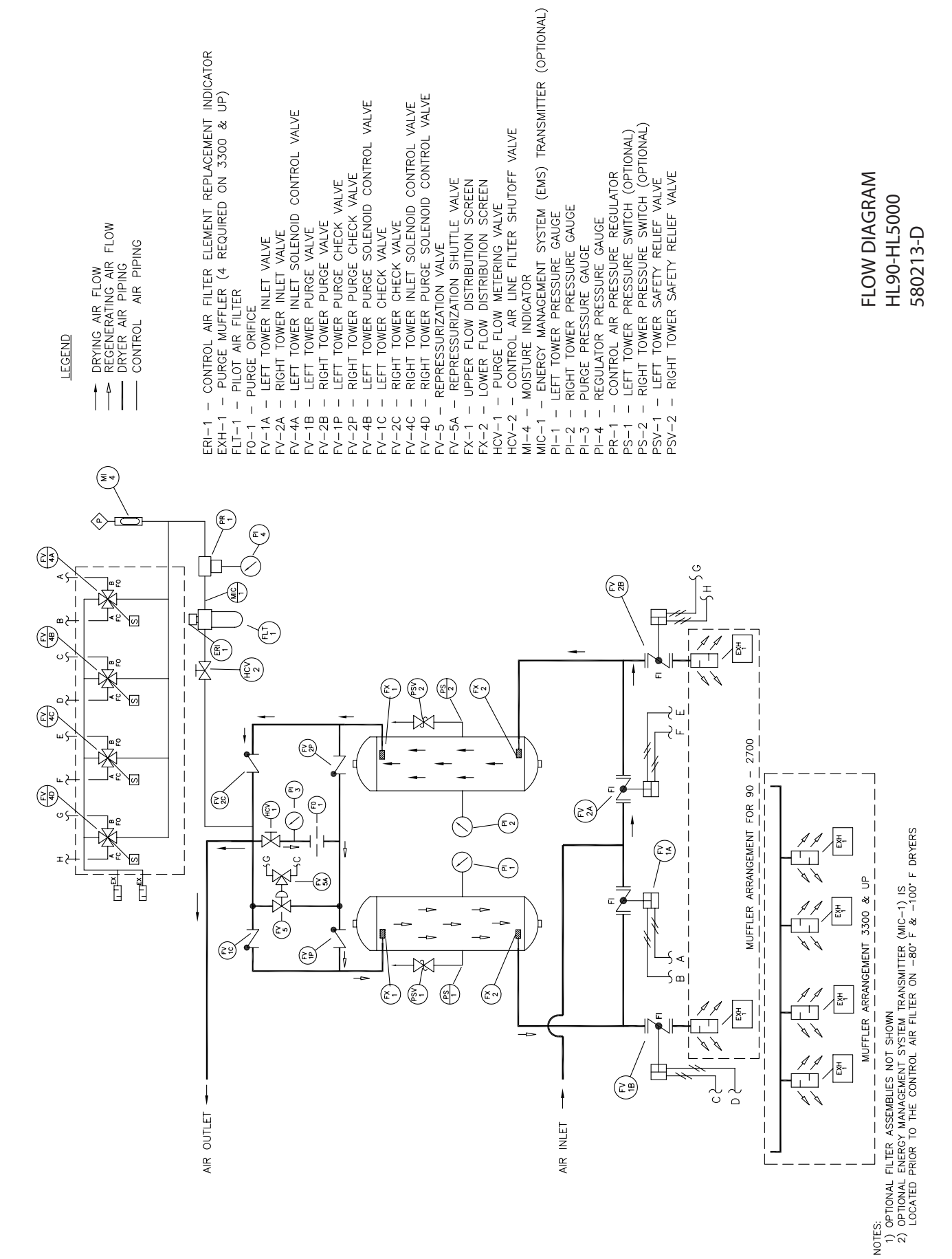


GENERAL ARRANGEMENT
HL3300-HL4000
580092-F


GENERAL ARRANGEMENT
HL5000
580306-C
CONTROLLER & DISPLAY PANEL DETAIL
POWER ON LIGHT
LEFT TOWER REGEN LIGHT
LEFT TOWER DRYING LIGHT
DRYER OFF / ALARM LIGHT
RIGHT TOWER REGEN LIGHT
RIGHT TOWER DRYING LIGHT
LCD DISPLAY
1) DRYER ON/OFF
2) DRYER ALARM
3) LEFT/RIGHT TOWER DRYING
4) LEFT/RIGHT TOWER REGEN
5) DEW POINT CONTROL
6) REGEN SEQUENCE STATUS
7) COMPRESSOR INTERLOCK
8) AUTO RESTART
PUSH BUTTONS
1) ON
2) OFF
3) RESET
4) TEST
5) SET
6) SELECT DISPLAY
7) ENTER
8) +/-
PURGE ADJUSTMENT VALVE
TOWER RELIEF VALVE
PURGE FLOW GAUGE
6" FLUSH FLANGE 125# AIR INLET CONNECTION
PURGE VALVE
FLOW VALVE
PURGE MUFFLER
6" RAISED FLANGE 150# AIR OUTLET CONNECTION
℄ OF AIR OUTLET
℄ OF AIR INLET
28.00
60.00
34.75
64.00
FACE OF AIR OUTLET
FACE OF AIR INLET
44.50
DO NOT LIFT HERE
ELECTRICAL ENCLOSURE NEMA 4
92.00
102.00
DESICCANT FILL PORT
DESICCANT DRAIN PORT
CONTROLLER AND DISPLAY PANEL SEE DETAIL
TOWER PRESSURE GAUGE
BLUE MOISTURE INDICATOR
12.00
32.50
72.00
27.50
PILOT AIR FILTER
60.00
63.00
℄ OF MOUNTING HOLE
48.00
6.00 TYP
1.50 TYP
14 Ø .62 MOUNTING HOLES
NOTES:
1. MAXIMUM WORKING PRESSURE - 150 PSI.
2. SAFETY RELIEF VALVE SETTING - 165 PSI.
3. PILOT AIR IS NOT SUPPLIED AS PART OF THE UNIT. SEE INSTALLATION MANUAL FOR PILOT AIR REQUIREMENTS.
4. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODES LATEST EDITION.
5. ALL PIPING SHALL BE IN ACCORDANCE WITH THE LOCAL CODES AND REGULATIONS.
6. FILTER PIPING SUPPORT IF REQUIRED TO BE SUPPLIED BY CUSTOMER.


WIRING DIAGRAM
HL90-HL5000
TM-580078-C
ITEMS THAT APPEAR IN GRAY MAY NOT BE INCLUDED. THESE ITEMS ARE OPTIONAL OR ADDED AS REQUIRED PER DRYER ORDER.
R2 = 200 OHM, 1/2 W, 5 %
R3 = 250 OHM, 1/4 W, 0.1 %
TB-1
TB-2
CUSTOMERS 115 VOLT POWER SUPPLY
CUSTOMER'S REMOTE ALARM CONTACTS DRY CONTACTS RATED FOR 10 A / 120 V
DCPS-5V
DCPS-0V
DPC-AN2
DCPS-24V
DPC-I0
DPC-I1
DPC-AN3
DEWPOINT TRANSMITTER TR-1
LEFT TOWER PRESSURE SWITCH PS-1
RIGHT TOWER PRESSURE SWITCH PS-2
COMPRESSOR INTERLOCK 5 VDC SUPPLY SIGNAL
COMPRESSOR INTERLOCK 5 VDC RETURN SIGNAL
DYNOPTIC PANEL (DOP)
115 / 1 / 60
(DCPS)
(DPC) CONTROLLER W/KEYPAD
REMOTE ALARM
LEFT TOWER PURGE VALVE FV-4B
RIGHT TOWER PURGE VALVE FV-4D
LEFT TOWER INLET VALVE FV-4A
RIGHT TOWER INLET VALVE FV-4C
NOTES:
1) ALL 115 V POWER CONTROL WIRE IS BLACK, ALL COMMON CONTROL WIRE IS WHITE, ALL DC VOLTAGE WIRE IS BLUE (+) AND BLUE WITH WHITE STRIPE (–)..


LEGEND
DRYING AIR FLOW
REGENERATING AIR FLOW
DRYER AIR PIPING
CONTROL AIR PIPING
OPTIONAL PIPING
DR–1 – INLET FILTER DRAIN
ERI–1 – CONTROL AIR FILTER ELEMENT REPLACEMENT INDICATOR
ERI–2 – INLET FILTER ELEMENT REPLACEMENT INDICATOR
ERI–3 – OUTLET FILTER ELEMENT REPLACEMENT INDICATOR
EXH–1 – TOWER PURGE MUFFLER
FLT–1 – PILOT AIR FILTER
FLT–2 – HIGH EFFICIENCY PREFILTER
FLT–3 – DUST PARTICULATE AFTERFILTER
FO–1 – PURGE ORIFICE
FV–1A – LEFT TOWER INLET VALVE
FV–2A – RIGHT TOWER INLET VALVE
FV–4A – LEFT TOWER INLET SOLENOID CONTROL VALVE
FV–1B – LEFT TOWER PURGE VALVE
FV–2B – RIGHT TOWER PURGE VALVE
FV–4B – LEFT TOWER PURGE SOLENOID CONTROL VALVE
FV–1C – LEFT TOWER CHECK VALVE
FV–2C – RIGHT TOWER CHECK VALVE
FV–4C – RIGHT TOWER INLET SOLENOID CONTROL VALVE
FV–4D – RIGHT TOWER PURGE SOLENOID CONTROL VALVE
FV–1P – LEFT TOWER PURGE CHECK VALVE
FV–2P – RIGHT TOWER PURGE CHECK VALVE
FX–1 – UPPER FLOW DISTRIBUTION SCREEN
FX–2 – LOWER FLOW DISTRIBUTION SCREEN
HCV–1 – PURGE FLOW METERING VALVE
HCV–2 – CONTROL AIR SHUTOFF VALVE
HCV–3 – DRYER BYPASS VALVE 3–PLACES (OPTIONAL)
MI–4 – MOISTURE INDICATOR
MIC–1 – ENERGY MANAGEMENT SYSTEM (EMS) TRANSMITTER (OPTIONAL)
PI–1 – LEFT TOWER PRESSURE GAUGE
PI–2 – RIGHT TOWER PRESSURE GAUGE
PI–3 – PURGE PRESSURE GAUGE
PS–1 – LEFT TOWER PRESSURE SWITCH (OPTIONAL)
PS–2 – RIGHT TOWER PRESSURE SWITCH (OPTIONAL)
PSV–1 – LEFT TOWER SAFETY RELIEF VALVE
PSV–2 – RIGHT TOWER SAFETY RELIEF VALVE
NOTE:
1) OPTIONAL ENERGY MANAGEMENT SYSTEM TRANSMITTER (MIC-1) IS LOCATED PRIOR TO THE CONTROL AIR FILTER ON -80°F & -100° F DRYERS
FLOW DIAGRAM
HL90-HL2700
580022-E
AIR OUTLET
AIR INLET
ATMOS.


LEGEND
DRYING AIR FLOW
REGENERATING AIR FLOW
DRYER AIR PIPING
CONTROL AIR PIPING
ERI-1 – CONTROL AIR FILTER ELEMENT REPLACEMENT INDICATOR
EXH-1 – PURGE MUFFLER (4 REQUIRED ON 3300 & UP)
FLT-1 – PILOT AIR FILTER
FO-1 – PURGE ORIFICE
FV-1A – LEFT TOWER INLET VALVE
FV-2A – RIGHT TOWER INLET VALVE
FV-4A – LEFT TOWER INLET SOLENOID CONTROL VALVE
FV-1B – LEFT TOWER PURGE VALVE
FV-2B – RIGHT TOWER PURGE VALVE
FV-1P – LEFT TOWER PURGE CHECK VALVE
FV-2P – RIGHT TOWER PURGE CHECK VALVE
FV-4B – LEFT TOWER PURGE SOLENOID CONTROL VALVE
FV-1C – LEFT TOWER CHECK VALVE
FV-2C – RIGHT TOWER CHECK VALVE
FV-4C – RIGHT TOWER INLET SOLENOID CONTROL VALVE
FV-4D – RIGHT TOWER PURGE SOLENOID CONTROL VALVE
FV-5 – REPRESSURIZATION VALVE
FV-5A – REPRESSURIZATION SHUTTLE VALVE
FX-1 – UPPER FLOW DISTRIBUTION SCREEN
FX-2 – LOWER FLOW DISTRIBUTION SCREEN
HCV-1 – PURGE FLOW METERING VALVE
HCV-2 – CONTROL AIR LINE FILTER SHUTOFF VALVE
MI-4 – MOISTURE INDICATOR
MIC-1 – ENERGY MANAGEMENT SYSTEM (EMS) TRANSMITTER (OPTIONAL)
PI-1 – LEFT TOWER PRESSURE GAUGE
PI-2 – RIGHT TOWER PRESSURE GAUGE
PI-3 – PURGE PRESSURE GAUGE
PI-4 – REGULATOR PRESSURE GAUGE
PR-1 – CONTROL AIR PRESSURE REGULATOR
PS-1 – LEFT TOWER PRESSURE SWITCH (OPTIONAL)
PS-2 – RIGHT TOWER PRESSURE SWITCH (OPTIONAL)
PSV-1 – LEFT TOWER SAFETY RELIEF VALVE
PSV-2 – RIGHT TOWER SAFETY RELIEF VALVE
AIR OUTLET
AIR INLET
MUFFLER ARRANGEMENT FOR 90 – 2700
MUFFLER ARRANGEMENT 3300 & UP
NOTES:
1) OPTIONAL FILTER ASSEMBLIES NOT SHOWN
2) OPTIONAL ENERGY MANAGEMENT SYSTEM TRANSMITTER (MIC-1) IS LOCATED PRIOR TO THE CONTROL AIR FILTER ON -80° F & -100° F DRYERS

FLOW DIAGRAM
HL90-HL5000
580213-D

DESCRIPTION	HL901H00 AA	HL1201H00 AA	HL1601H00 AA	HL2001H00 AA	HL2501H00 AA	QTY/ UNIT	SPARES 1	2	3
BLUE MOISTURE INDICATOR	705001-SP	705001-SP	705001-SP	705001-SP	705001-SP	1			
DESICCANT, 4-8mm GRADE D	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1			
DISPLAY BOARD, PANEL	633653	633653	633653	633653	633653	1			
DRYER CONTROLLER, TYPE 4 WITH DESICCANT PROGRAM (Dryer model and serial number must be provided with order to ensure proper configuration.)	800030	800030	800030	800030	800030				
ELEMENT, PILOT AIR FILTER	Refer to page 45 for Pilot Air Filter Element Section					1	1	1	2
ELEMENT, PRE-FILTER 105 SCFM	85565679	-	-	-	-				
ELEMENT, PRE-FILTER 125 SCFM	-	85565711	-	-	-	1	1	1	2
ELEMENT, PRE-FILTER 233 SCFM	-	-	85565752	85565752	-	1	1	1	2
ELEMENT, PRE-FILTER 250 SCFM	-	-	-	-	85565794	1	1	1	2
ELEMENT, POST-FILTER 105 SCFM	85565661	-	-	-	-	1	1	1	2
ELEMENT, POST-FILTER 125 SCFM	-	85565703	-	-	-	1	1	1	2
ELEMENT, POST-FILTER 233 SCFM	-	-	85565745	85565745	-	1	1	1	2
ELEMENT, POST-FILTER 250 SCFM	-	-	-	-	85565786	1	1	1	2
GAUGE, PURGE/TOWER PRESSURE 2 1/2"	680572	680572	680572	680572	680572	3			
MUFFLER, PURGE, 1/2"	680619	680619	-	-	-	2			
MUFFLER, PURGE, 1"	-	-	680454	680454	680454	2			
OVERLAY, CONTROLLER	634086	634086	634086	634086	634086	1			
POWER SUPPLY, 5V/24VDC	633665-SP	633665-SP	633665-SP	633665-SP	633665-SP	1	1	1	1
RESISTOR, 5V LOAD, 200 OHM	683968	683968	683968	683968	683968	1			
RETAINER, DESICCANT SCREEN ASSEMBLY	705604-SP	705604-SP	705604-SP	705180-SP	705180-SP	4			
VALVE, DIAPHRAGM, 1" P.O.N.O.	630721	630721	-	-	-	2			
VALVE, DIAPHRAGM, 1 1/2" P.O.N.O.	-	-	630725	630725	630725	2			
VALVE, DIAPHRAGM, 2" P.O.N.O.	-	-	-	-	-	2			
VALVE, DIAPHRAGM, 3/4" P.O.N.C	630569	630569	-	-	-	2			
VALVE, DIAPHRAGM, 1" P.O.N.C.	-	-	630725	630725	630725	2			
VALVE, BALL, CONTROL AIR, 1/4"	681621	681621	681621	681621	681621	1			
VALVE, BALL, PURGE, 1/2"	680029	680029	680029	680029	-	1			
VALVE, BALL PURGE, 3/4"	-	-	-	-	680429	1			
VALVE, CHECK, PURGE, 1/2"	AD0510	AD0510	AD0510	AD0510	-	2			
VALVE, CHECK, PURGE, 3/4"	-	-	-	-	AD0515	2			
VALVE, CHECK, FLOW, 1"	632790	632790	632790	-	-	2			
VALVE, CHECK, FLOW, 1 1/2"	-	-	-	632791	632791	2			
VALVE, SAFETY/RELIEF 1/4"	630730	630730	630730	630730	630730	2			
VALVE, SOLENOID, CONTROL AIR, 24VDC MINI	633658	633658	633658	633658	633658	1			

NOTE 1: Refer to the Desiccant Fill Chart in the Maintenance section.

Spare. Quantities under this heading reflect the number of each item which we recommend be kept on hand for maintenance or repair.

The appropriate quantity for your application will depend on how critical interruptions in service are to your operation.

Class	Quantity	Suggested for
1	Minimum	Domestic service where interruptions in service are acceptable.
2	Average	Domestic service where some interruptions in service are acceptable.
3	Maximum	Export service or for domestic service where interruptions in service are unacceptable.

DESCRIPTION	HL3001H00 AA	HL4001H00 AA	HL5001H00 AA	HL6001H00 AA	HL8001H00 AA	QTY/ UNIT	SPARES 1	2	3
BLUE MOISTURE INDICATOR	705001-SP	705001-SP	705001-SP	705001-SP	705001-SP	1			
DESICCANT, 4-8mm GRADE D	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1			
DISPLAY BOARD, PANEL	633653	633653	633653	633653	633653	1			
DRYER CONTROLLER, TYPE 4 WITH DESICCANT PROGRAM (Dryer model and serial number must be provided with order to ensure proper configuration.)	800030	800030	800030	800030	800030	1			
ELEMENT, PILOT AIR FILTER	Refer to page 45 for Pilot Air Filter Element Section					1	1	1	1
ELEMENT, PRE-FILTER 339 SCFM	85565836	-	-	-	-	1	1	1	1
ELEMENT, PRE-FILTER 466 SCFM	-	85565877	-	-	-	1	1	1	1
ELEMENT, PRE-FILTER 580 SCFM	-	-	85565919	-	-	1	1	1	1
ELEMENT, PRE-FILTER 680 SCFM	-	-	-	85565968	-	1	1	1	1
ELEMENT, PRE-FILTER 900 SCFM	-	-	-	-	85565992	1	1	1	1
ELEMENT, POST-FILTER 339 SCFM	85565828	-	-	-	-	1	1	1	1
ELEMENT, POST-FILTER 466 SCFM	-	85565869	-	-	-	1	1	1	1
ELEMENT, POST-FILTER 580 SCFM	-	-	85565901	-	-	1	1	1	1
ELEMENT, POST-FILTER 680 SCFM	-	-	-	85565950	-	1	1	1	1
ELEMENT, POST-FILTER 900 SCFM	-	-	-	-	85565984	1	1	1	1
GAUGE, PURGE/TOWER PRESSURE 2 1/2"	680572	680572	680572	680572	-	3			
GAUGE, PURGE/TOWER PRESSURE 3 1/2"	-	-	-	-	631324	3			
MUFFLER, PURGE, 1" MPT	680454	680454	680454	680454	-	2	2	2	2
MUFFLER, PURGE, 1 1/2"	-	-	-	-	680711	2	2	2	2
OVERLAY, CONTROLLER	634086	634086	634086	634086	634086	1			
POWER SUPPLY, 5V/24VDC	633665-SP	633665-SP	633665-SP	633665-SP	633665-SP	1	1	1	1
RESISTOR, 5V LOAD, 200 OHM	683968	683968	683968	683968	683968	1			
RETAINER, DESICCANT SCREEN ASSEMBLY	705180-SP	-	705180-SP	705180-SP	-	4			
RETAINER, DESICCANT SCREEN ASSEMBLY 2"	-	704972-SP	-	-	-	4			
RETAINER, DESICCANT SCREEN ASSEMBLY 3 X 2	-	-	725195-SP	725195-SP	-	4			
RETAINER, DESICCANT SCREEN ASSEMBLY 3"	-	-	-	-	725139-SP	4			
VALVE, DIAPHRAGM, 1" P.O.N.C.	630575	630575	630575	630575	-	2			
VALVE, DIAPHRAGM, 1 1/2" P.O.N.C.	-	-	-	-	630572	2			
VALVE, DIAPHRAGM, 2" P.O.N.O.	633667	633667	633667	633667	-	2			
VALVE, DIAPHRAGM, 3" P.O.N.O.	-	-	-	-	631478	2			
VALVE, BALL, CONTROL AIR, 1/4"	681621	681621	681621	681621	681621	1			
VALVE, BALL, PURGE ADJUST, 3/4"	680429	680429	680429	680429	-	1			
VALVE, BALL, PURGE ADJUST, 1 1/2"	-	-	-	-	680712	1			
VALVE, CHECK, PURGE, 3/4"	AD0515	AD0515	AD0515	AD0515	-	2			
VALVE, CHECK, PURGE, 1 1/2"	-	-	-	-	683983	2			
VALVE, CHECK, FLOW, 1 1/2"	632791	-	-	-	-				
VALVE, CHECK, FLOW, 2"	-	632792	632792	632792	-	2			
VALVE, CHECK, FLOW, 3"	-	-	-	-	632794	2			
VALVE, SAFETY/RELIEF 1/4"	630730	630730	630730	630730	-	2			
VALVE, SAFETY/RELIEF 1/2"	-	-	-	-	680896	2			
VALVE, SOLENOID 24VDC MINI	633658	633658	633658	633658	633658	1			

NOTE 1: Refer to the Desiccant Fill Chart in the Maintenance section.

Spare. Quantities under this heading reflect the number of each item which we recommend be kept on hand for maintenance or repair.

The appropriate quantity for your application will depend on how critical interruptions in service are to your operation.

Class	Quantity	Suggested for
1	Minimum	Domestic service where interruptions in service are acceptable.
2	Average	Domestic service where some interruptions in service are acceptable.
3	Maximum	Export service or for domestic service where interruptions in service are unacceptable.

DESCRIPTION	HL10001H00 AA	HL12001H00 AA	HL15001H00 AA	HL18001H00 AA	HL21001H00 AA	QTY/ UNIT	SPARES 1	2	3
BLUE MOISTURE INDICATOR	705001-SP	705001-SP	705001-SP	705001-SP	705001-SP	1			
DESICCANT, 4-8mm GRADE D	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1			
DISPLAY BOARD, PANEL	633653	633653	633653	633653	633653	1			
DRYER CONTROLLER, TYPE 4 WITH DESICCANT PROGRAM (Dryer model and serial number must be provided with order to ensure proper configuration.)	800030	800030	800030	800030	800030	1			
ELEMENT, PILOT AIR FILTER	Refer to page 45 for Pilot Air Filter Element Section					1	1	1	1
ELEMENT, PRE-FILTER 1070 SCFM	85566230	-	-	-	-	1	1	1	1
ELEMENT, PRE-FILTER 1250 SCFM	-	85566248	-	-	-	1	1	1	1
ELEMENTS, PRE-FILTER 1800 SCFM	-	-	38446357	38446357	-	3	3	3	3
ELEMENTS, PRE-FILTER 2400 SCFM	-	-	-	-	38446357	4	4	4	4
ELEMENT, POST-FILTER 1070 SCFM	85566214	-	-	-	-	1	1	1	1
ELEMENT, POST-FILTER 1250 SCFM	-	85566222	-	-	-	1	1	1	1
ELEMENT, POST-FILTER 1800 SCFM	-	-	23553357	23553357		3	3	3	3
ELEMENT, POST-FILTER 2400 SCFM	-	-			23553357	4	4	4	4
GAUGE, PURGE/TOWER PRESSURE 3 1/2"	631324	631324	631324	631324	631324	3			
MUFFLER, PURGE, 1 1/2"	680711	680711	-	-	-	2	2	2	2
MUFFLER, PURGE, 2"	-	-	680455	680455	680455	2	2	2	2
OVERLAY, CONTROLLER	634086	634086	634086	634086	634086	1			
POWER SUPPLY, 5V/24VDC	633665-SP	633665-SP	633665-SP	633665-SP	633665-SP	1	1	1	1
RESISTOR, 5V LOAD, 200 OHM	683968	683968	683968	683968	683968	1			
RETAINER, SCREEN ASSEMBLY 3"	725139-SP	725139-SP	-	-	-	4			
RETAINER, SCREEN ASSEMBLY 4"	-	-	725140-SP	725269-SP	725269-SP	4			
VALVE, DIAPHRAGM,1 1/2" P.O.N.C.	630572	630572	-	-	-	2			
VALVE, DIAPHRAGM, 2" P.O.N.C.	-	-	633701	633701	633701	2			
VALVE, DIAPHRAGM, 3" P.O.N.O.	631478	631478	-	-	-	2			
VALVE, DIAPHRAGM, 4" P.O.N.O.	-	-	630406	630406	630406	2			
VALVE, BALL, CONTROL AIR, 1/4"	681621	681621	681621	681621	681621	1			
VALVE, BALL, PURGE ADJUST, 1 1/2"	680712	680712	680712	680712	680712	1			
VALVE, BALL, PURGE ADJUST, 2"	-	-	-	-	-	1			
VALVE, CHECK, PURGE, 1 1/2"	683983	683983	683983	683983	683983	2			
VALVE, CHECK, FLOW, 3"	632794	632794	632794	632794	632794	2			
VALVE, SAFETY/RELIEF 1/2"	680896	680896	680896	-	-	2			
VALVE, SAFETY/RELIEF 3/4"	-	-	-	AD1415	AD1415	2			
VALVE, SOLENOID 24VDC MINI	633658	633658	633658	633658	633658	1			

NOTE 1: Refer to the Desiccant Fill Chart in the Maintenance section.

Spare. Quantities under this heading reflect the number of each item which we recommend be kept on hand for maintenance or repair.

The appropriate quantity for your application will depend on how critical interruptions in service are to your operation.

Class	Quantity	Suggested for
1	Minimum	Domestic service where interruptions in service are acceptable.
2	Average	Domestic service where some interruptions in service are acceptable.
3	Maximum	Export service or for domestic service where interruptions in service are unacceptable.

DESCRIPTION	HL27001H00 AA	HL33001H00 AA	HL40001H00 AA	HL50001H00 AA	QTY/ UNIT	SPARES 1	2	3
BLUE MOISTURE INDICATOR	705001-SP	705001-SP	705001-SP	705001-SP	1			
DESICCANT, 4-8mm GRADE D	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1			
DISPLAY BOARD, PANEL	633653	633653	633653	633653	1			
DRYER CONTROLLER, TYPE 4 WITH DESICCANT PROGRAM (Dryer model and serial number must be provided with order to ensure proper configuration.)	800030	800030	800030	800030	1			
ELEMENT, PILOT AIR FILTER	Refer to page 45 for Pilot Air Filter Element Section				1	1	1	1
ELEMENT, PRE-FILTER 3000 SCFM	38446357	-	-	-	5	5	5	5
ELEMENT, PRE-FILTER 3600 SCFM	-	38446357	-	-	6	6	6	6
ELEMENT, PRE-FILTER 4200 SCFM	-	-	38446357	-	7	7	7	7
ELEMENT, PRE-FILTER 6000 SCFM	-	-	-	38446357	10	10	10	10
ELEMENT, POST-FILTER 3000 SCFM	23553357	-	-	-	5	5	5	5
ELEMENT, POST-FILTER 3600 SCFM	-	23553357	-	-	6	6	6	6
ELEMENT, POST-FILTER 4200 SCFM	-	-	23553357	-	7	7	7	7
ELEMENT, POST-FILTER 6000 SCFM	-	-	-	23553357	10	10	10	10
GAUGE, PURGE/TOWER PRESSURE 3 1/2"	631324	631324	631324	631324	3			
MUFFLER, PURGE, 2"	680455	680455	680455	680455	2	2	2	2
OVERLAY, CONTROLLER	634086	634086	634086	634086	1			
POWER SUPPLY, 5V/24VDC	633665-SP	633665-SP	633665-SP	633665-SP	1	1	1	1
RESISTOR, 5V LOAD, 200 OHM	683968	683968	683968	683968	1			
RETAINER, SCREEN ASSEMBLY 4"	725269-SP	-	-	-	4			
RETAINER, SCREEN ASSEMBLY 6"	-	725151-SP	725151-SP	725151-SP	4			
VALVE, DIAPHRAGM, 2" P.O.N.C.	633701	-	-	-	2			
VALVE, DIAPHRAGM, 3/ 4" P.O.N.O.	-	630622	630622	-	2			
VALVE, DIAPHRAGM, 1" P.O.N.O.	-	-	-	630721	2			
VALVE, DIAPHRAGM, 4" P.O.N.O.	630406	-	-	-	2			
VALVE, BUTTERFLY, 3"	-	632170	632170	632170	2			
VALVE, BUTTERFLY, 6"	-	632172	632172	632172	2			
VALVE, BALL, CONTROL AIR, 1/4"	681621	681621	681621	681621	1			
VALVE, BALL, PURGE ADJUST, 2"	680466	680466	680466	680466	1			
VALVE, CHECK, PURGE, 2"	633943	633943	633943	-	2			
VALVE, CHECK, PURGE, 3"	-	-	-	634098	2			
VALVE, CHECK, FLOW, 4"	633364	633364	633364	-	2			
VALVE, CHECK, FLOW, 6"	-	-	-	633365	2			
VALVE, SAFETY/RELIEF 3/4"	AD1415	AD1415	AD1415	AD1415	2			
VALVE, SOLENOID 24VDC MINI	633658	-	-	-	4			
VALVE, SOLENOID 24VDC MINI	-	633604	633604	633604	4			

NOTE 1: Refer to the Desiccant Fill Chart in the Maintenance section.

Spare. Quantities under this heading reflect the number of each item which we recommend be kept on hand for maintenance or repair.

The appropriate quantity for your application will depend on how critical interruptions in service are to your operation.

Class	Quantity	Suggested for
1	Minimum	Domestic service where interruptions in service are acceptable.
2	Average	Domestic service where some interruptions in service are acceptable.
3	Maximum	Export service or for domestic service where interruptions in service are unacceptable.

DIAPHRAGM VALVE REBUILD KITS

VALVE DESCRIPTION	VALVE PART # *	SEAL KIT PART #	HARDWARE KIT PART #
VALVE, DIAPHRAGM, 3/4" P.O.N.C.	630569	630391	631762
VALVE, DIAPHRAGM, 1" P.O.N.C.	630575	630391	631762
VALVE, DIAPHRAGM, 1-1/2" P.O.N.C.	630572	630392	631763
VALVE, DIAPHRAGM, 2" P.O.N.C.	633701	633676	633702
VALVE, DIAPHRAGM, 1" P.O.N.O.	630721	630391	631757
VALVE, DIAPHRAGM, 1 1/2" P.O.N.O.	630725	630392	631758
VALVE, DIAPHRAGM, 2" P.O.N.O.	633667	633676	633677
VALVE, DIAPHRAGM, 3" P.O.N.O.	631478	630394	631760
VALVE, DIAPHRAGM, 4" P.O.N.O.	630406	630395	631761

NOTE: Refer to the list of individual parts at the beginning of the REPLACEMENT PARTS section to determine which Valve listed in the above table is applicable to your dryer. PART #'s for the relevant Seal Kits and Hardware Kits will be found in the adjacent columns.

EMS REPLACEMENT PARTS	
DESCRIPTION	**PART#**
TRANSMITTER, DEWPOINT -40°F	633660
TRANSMITTER, DEWPOINT -100°F	633720
CABLE, TRANSMITTER	633671
BLOCK, SAMPLE -40°F	633661
BLOCK, SAMPLE -100°F	632823

BUTTERFLY VALVE PARTS AND REBUILD KITS

VALVE DESCRIPTION	VALVE W/ ACT	VALVE ONLY	VALVE REPAIR KIT	ACTUATOR	ACTUATOR KIT
VALVE, BUTTERFLY 3" W/ ACTUATOR	632170	633831	632685	632985	632686
VALVE, BUTTERFLY 6" W/ ACTUATOR	632172	633833	633834	633578	633579

PILOT AIR FILTER REPLACEMENT ELEMENT

To determine the correct replacement element for the Pilot Air Filter, visually identify the filter that is mounted on the right side of the Electrical Enclosure and compare it to the options shown below. Select the replacement element that matches the Pilot Air Filter and use the corresponding Part Number when ordering

Use Replacement Element Part Number: 85565513	Use Replacement Element Part Number: 104424

18.0 ENGINEERING SPECIFICATIONS

MODEL	Inlet Flow -40 Dew-point SCFM	Inlet Flow -100 Dewpoint SCFM	Purge Flow (m^3/h)	Width in. (cm)	Depth in. w/o Bypass (cm)	Depth in. w/ Bypass (cm)	Height in (cm)	Air In & Out Conne-ction	Shipping Weight lbs (kg)	Desiccant Weight per Dryer (kg)
HL90	90	72	14	40.5 (102.9)	30 (76.2)	37.5 (95.3)	63.12 (160.3)	1	475 (213)	100 (45)
HL120	120	96	19	40.5 (102.9)	30 (76.2)	37.5 (95.3)	63.12 (160.3)	1	563 (255)	134 (61)
HL160	160	128	26	44.5 (113)	32 (81.3)	43.75 (111.1)	66.12 (167.9)	1 1/2	707 (321)	192 (87)
HL200	200	160	30	44.5 (113)	32 (81.3)	43.75 (111.1)	66.12 (167.9)	1 1/2	731 (332)	236 (107)
HL250	250	200	40	48.5 (123.2)	32 (81.3)	44.19 (112.2)	66.81 (169.7)	1 1/2	869 (394)	290 (132)
HL300	300	240	48	48.5 (123.2)	32 (81.3)	50.38 (128.0)	66.81 (169.7)	2	924 (419)	344 (156)
HL400	400	320	65	52.5 (133.4)	36.19 (91.9)	50.94 (129.4)	67.81 (172.2)	2	1115 (506)	470 (213)
HL500	500	400	81	56.5 (143.5)	39.69 (100.8)	54.5 (138.4)	82.5 (209.6)	2	1564 (709)	638 (289)
HL600	600	480	93	56.5 (143.5)	42.4 (107.8)	57.25 (145.4)	82.5 (209.6)	2	1664 (755)	748 (339)
HL800	800	640	130	64 (162.6)	51.25 (130.2)	64.38 (163.5)	87.62 (222.6)	3	2017 (915)	900 (408)
HL1000	1000	800	162	64 (162.6)	51.25 (130.2)	64.38 (163.5)	87.62 (222.6)	3	2237 (1015)	1100 (499)
HL1200	1200	960	195	64 (162.6)	51.25 (130.2)	64.38 (163.5)	87.62 (222.6)	3	2424 (1100)	1270 (576)
HL1500	1500	1200	243	78 (198.1)	54.76 (139.1)	N/A	80 (203.2)	4	2974 (1349)	1600 (726)
HL1800	1800	1440	292	84 (213.4)	60.62 (154.0)	N/A	91.88 (233.4)	4	3905 (1771)	2000 (907)
HL2100	2100	1680	340	84 (213.4)	60.62 (154.0)	N/A	91.88 (233.4)	4	4279 (1941)	2340 (1062)
HL2700	2700	2160	438	84 (213.4)	60.76 (154.3)	N/A	91.88 (233.4)	4	4926 (2234)	2928 (1328)
HL3300	3300	2640	535	96 (244)	66 (167.6)	N/A	100 (254)	6	2950 (1338)	3800 (1723) *
HL4000	4000	3200	649	96 (244)	66 (167.6)	N/A	100 (254)	6	3000 (1361)	4226 (1917) *
HL5000	5000	4000	811	102 (259)	72 (183)	N/A	92 (233.7)	6	3950 (1792)	5138 (2330) *

* Dryer weight shown does not include desiccant. Desiccant shipped separately.

Note: All above dryers rated at 150 psig, 120 °F max inlet temperature.
Capacity and purge flow is basis standard inlet conditions (100 psig / 100 °F) and will vary at different inlet conditions.

⚠ NOTICE

Specification information above accurate at time of publication. Refer to equipment serial label for actual specifications for units.

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HVAC Submittal Cover Sheet

SECTION: 11
PRODUCT: Humidifiers

Paulson-Cheek Mechanical, Inc.
6145 Norhtbelt Parkway, Suite F
Norcross, GA 30071

PHONE: 770-729-0076
FAX: 770-729-1076

PROJECT: **Medline Wildcat II - Lines 7&8**

LOCATION: **Lithia Springs, GA**

Paulson-Cheek Mechanical, Inc.

ARCHITECT'S/ENGINEER'S STAMP

Paulson-Cheek Mechanical, Inc.

DATE RECEIVED:	06/18/15
MANUFACTURER:	Carel USA
SUPPLIER:	GAA
SUBMITTED DATE:	06/18/15

[X] NO ERRORS DETECTED

[ ] CORRECT EXCEPTIONS NOTED

THIS APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OR VENDOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

CHECKED BY:	Carden Clark
DATE CHECKED:	06/18/15

Project	**201501579 - medline 515**
Date	6/4/2015
Prepared For	**Georgia Air Associates** **David Gray** 6135 Northbelt Drive, Suite A Norcross, GA 30071 6787365100
Prepared By	Carel USA Charles Claussen Manheim, PA
Manufacturer	Carel USA L.L.C. 385 South Oak Street Manheim, PA 17545

System **HUM-16** & HUM-17 Tag(s) HUM 16 & HUM-17

Materials

Model	Description	Qty	
UE035XM0U1	HUMISTEAM X TYPE 77 LBS/HR 460/3 STAND COND DISP CYL	~~1~~	2
SHOSE00040	RUBBER STEAM HOSE, 40 MM	~~20~~	40
DP060D40RU	STEAM DISTRIBUTOR DP SERIES INOX L=600MM DIAM.40	~~1~~	2
CHOSE00038	3/8" CONDENSATE HOSE FOR USE WITH METRIC DPs	~~23~~	46
PC-301	DUCT MOUNT DIFF. PRESS SW	~~1~~	2
DPDC112000	DUCT SENSOR TEMP. -10T60GR.C. (OUT 0-10VDC) / HUMID. RH 10-90% (OUT 0-10VDC)	~~1~~	2
DPDC112000	DUCT SENSOR TEMP. -10T60GR.C. (OUT 0-10VDC) / HUMID. RH 10-90% (OUT 0-10VDC)	~~1~~	2

Design Data

Duct Width	**30"**	Duct Height	**30"**
Air Flow	**2500 CFM**	Air Velocity	**400.0 FPM**
Outside Air	**10F @ 10%RH**	Outside Air Mix	**50%**
Entering Distributor	**70F @ 34%RH**	Leaving Distributor	**70F @ 75%RH**
Space	**70F @ 75%RH**	Load	**74 lbs/hr**

UE035XM0U1 Steam Humidifier Data

Height	**32.1"**	Width	**21.5"**
Depth	**14.8"**	Weight	**75.0 lbs**
Water Inlet	**3/4"G Male**	Water Drain	**3/4"G Male**
Steam Outlets	**1x40mm**	Capacity	**77.0 lbs/hr**
Voltage	**460V 3 Phase**	Power	**26.25 kW**
Outlet Max Pressure	**8 in.WC**		

SHOSE00040 Steam Hose Data

Inside Diameter	**40mm**

DP060D40RU Distributor Pipe Data

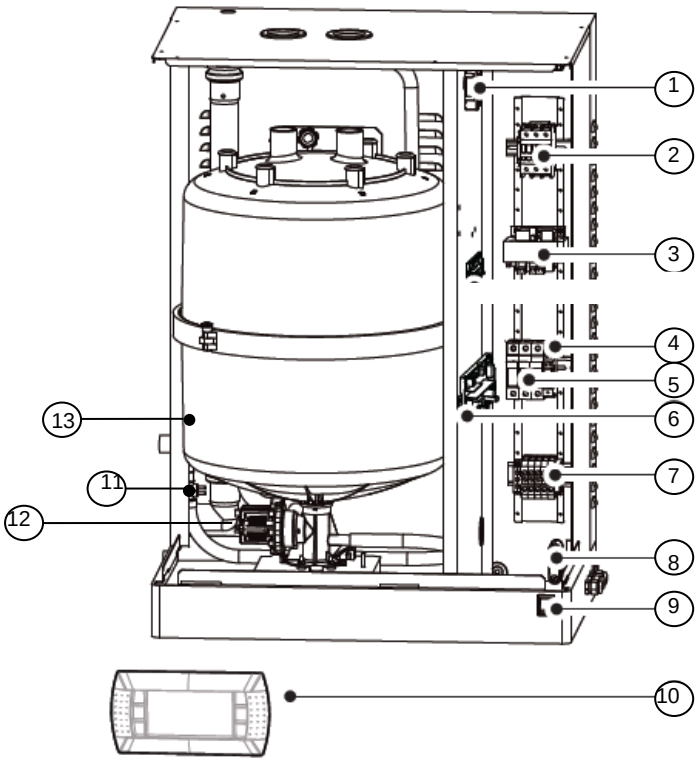
Length	**23.6 inches**	Capacity	**99.0 lbs/hr**
Design Load	**73.6 lbs/hr**	Absorption Distance	**64.1" @ 70F**

CHOSE00038 Condensate Hose Data

Inside Diameter	**3/8"**

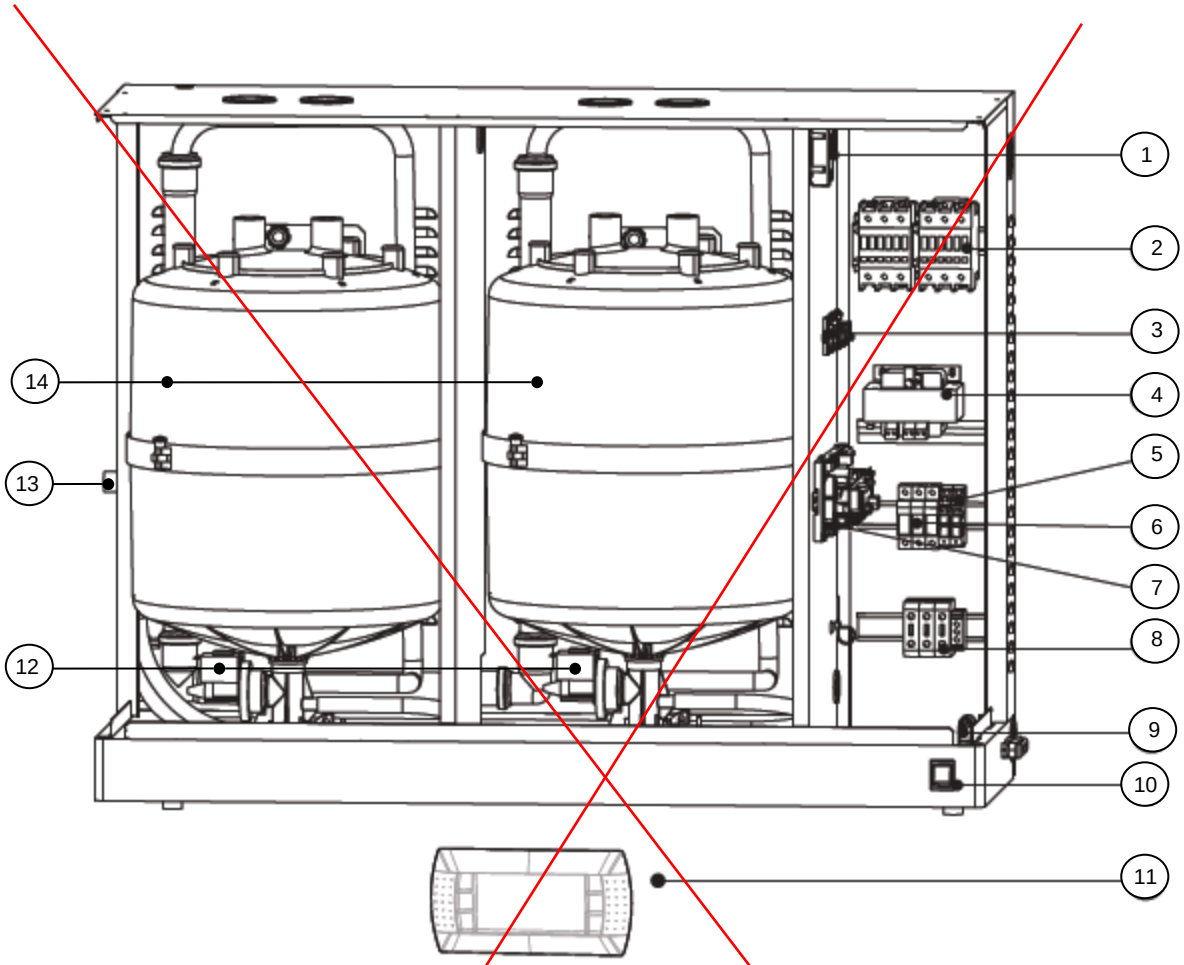
Product Documentation for: UEX 25 to 130 kg/h Humidifier

Description Of The Components



UE 025 through UE065	
No.	**Description**
1	Amperage transformer
2	Power contactor
3	Power transformer
4	Pump control relay
5	Fuses
6	Electronic Controller
7	Wiring terminal block
8	Cable raceway
9	On/Off Switch
10	Display (can be remote mounted)
11	Drain pump
12	Fill valve
13	Steam generator cylinder

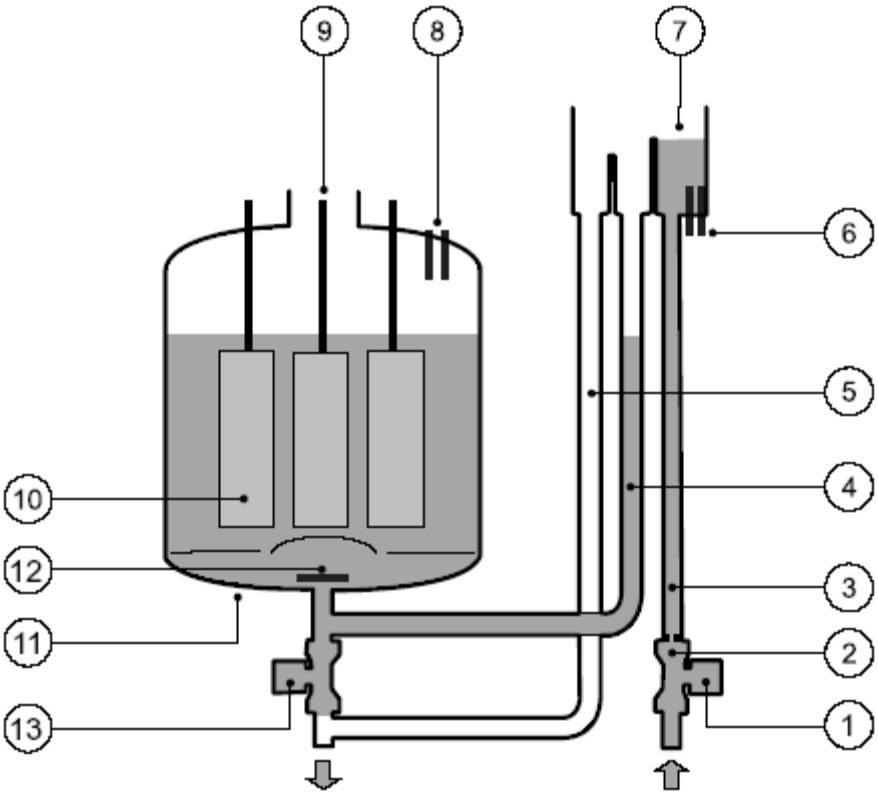
Description Of The Components



UE 090 through UE130	
No.	**Description**
1	Amperage transformer
2	Power contactor
3	High level alarm board
4	Power transformer
5	Pump relay
6	Fuses
7	Electronic Controller
8	Wiring terminal block
9	Cable raceway
10	On/Off switch
11	Display (can be remote mounted)
12	Water drain pump
13	Water fill valve
14	Steam generator cylinder

How the Humisteam Works

HumiSteam is an electrode humidifier. It produces steam for humidification by passing electrode current through the water in the steam generator cylinder between metal electrodes. There are no heater elements. Steam output is directly proportional to the conductivity of the water, and the amount of electrode immersed in the water.



On a call for humidity, the HumiSteam controller will open the water fill valve (1) and allow water to enter the system. A flow restrictor (2) prevents the unit from filling too quickly or with too much pressure. The water flows up the fill tube (3) and into the fill cup (7), where it flows over the conductivity probes (6), which feed the water conductivity back to the controller for analysis. Water then flows over the dam in the fill cup (7), which creates a 1" air gap to prevent backflow of contaminated water into the feed lines, and through the fill tube (4) and into the bottom of the steam cylinder (11).

As the water fills the cylinder, it will reach the electrodes (10) and current will begin to flow. As the water continues to fill the cylinder, the current will increase, and this is monitored by an amperage transformer placed on one of the power wires (9). When the desired current is reached, the fill valve will close (1) and the water will then begin to warm and produce steam. If the water reaches the cylinder full probes (8) prior to reaching the desired current level, the fill valve (1) will be closed to prevent overflow. If the current rises too much as the water fills the cylinder, the drain valve or pump (13) will be activated to drain away some water and reduce the current flow.

Periodically, based on the incoming water conductivity, the unit will drain some water to reduce the mineral concentration. A strainer (12) in the cylinder helps to prevent mineral debris from jamming the drain valve (13).

If there is no water in the cylinder, there will be no current flow and no steam production. The electrodes do not burn out, but they will eventually become comletely coated with mineral and the cylinder will then need to be replaced or cleaned.

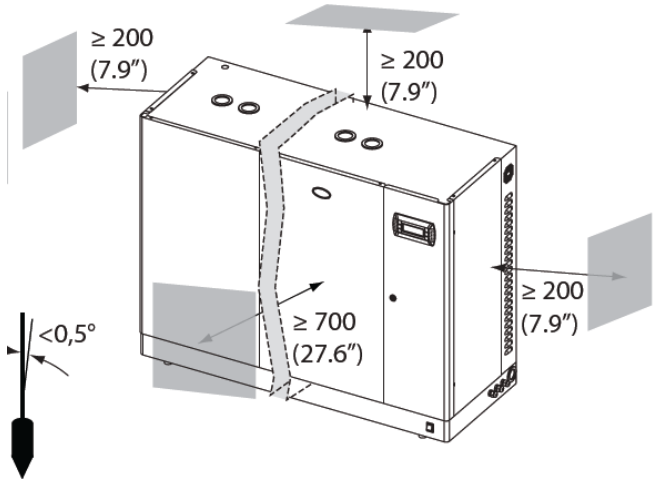
Positioning

The HumiSteam has been designed for wall mounting (although it can be placed on a stand) and, since it is an atmospheric steam humidifier, should be placed close to the point where the steam will be used, to minimize the steam hose length (and condensate). **Certain clearances must be maintained around the unit:**

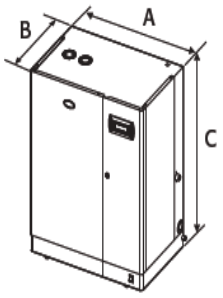
Dimensions and weights

Distances from the wall

Models UE025 to UE130



Models UE025 to UE065



Models UE090 to UE0130

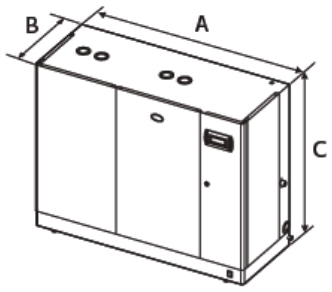


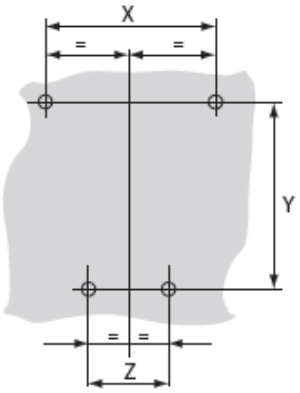
Fig. 1.b

		UE001 to UE008	UE009 to UE018	UE025 to UE045	UE045** to UE065
dimensions mm (in)	A	365 (14.4)		545 (21.5)	635 (25.0)
	B	275 (10.8)		375 (14.8)	465 (18.3)
	C	712 (28.0)		815 (32.0)	890 (35.0)
weights kg (lb)	packaged	16 (35.3)	20 (44.0)	39 (86.0)	51 (112.4)
	empty	13.5 (29.8)	17 (37.5)	34 (74.9)	44 (97.0)
	installed*	19 (41.9)	27 (59.5)	60.5 (133.4)	94 (207.2)

		UE090	UE130
dimensions mm (in)	A	1150 (45.3)	1150 (45.3)
	B	465 (18.3)	465 (18.3)
	C	890 (35.0)	890 (35.0)
weights kg (lb)	packaged	77 (169.8)	81 (178.6)
	empty	70 (154.3)	74 (163.1)
	Installed*	130 (286.6)	170 (374.8)

Mounting

Models UE025 to UE045



distance mm (in)	UE025 to UE045	UE045* to UE065
X	445 (17.5)	535 (21.0)
Y	655 (25.8)	730 (28.7)
Z	250 (9.8)	340 (13.4)

* 230 Vac models only

Fig. 1.g

Models UE090 to UE0130

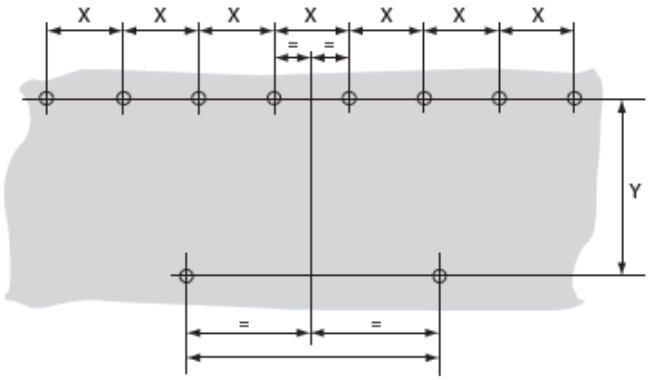
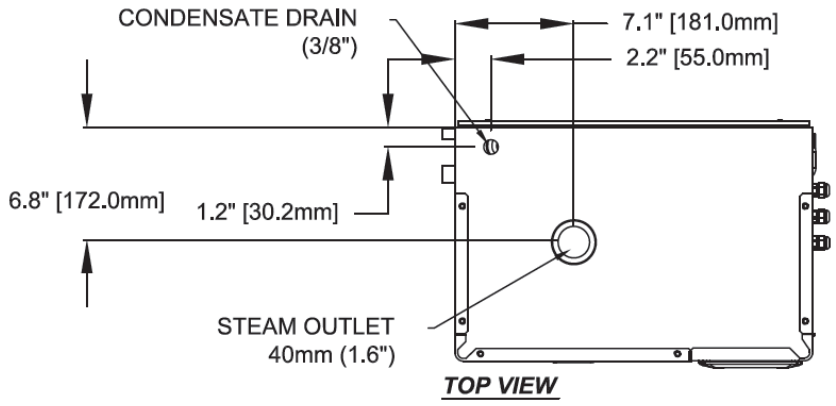
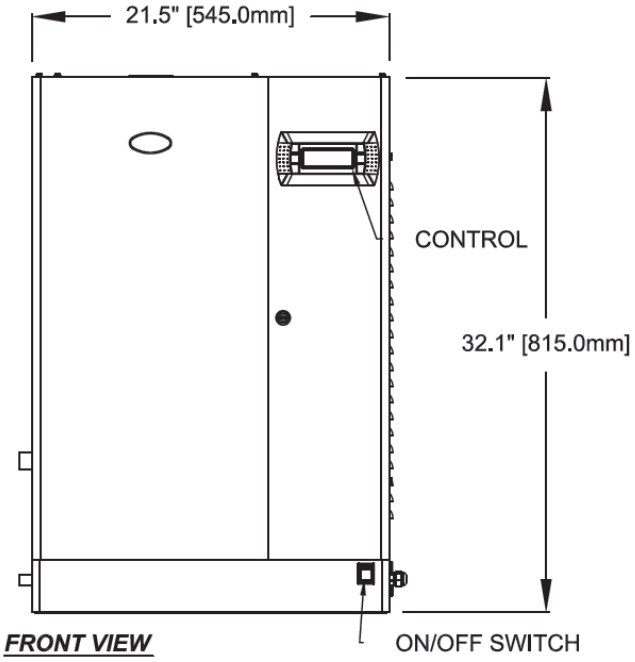
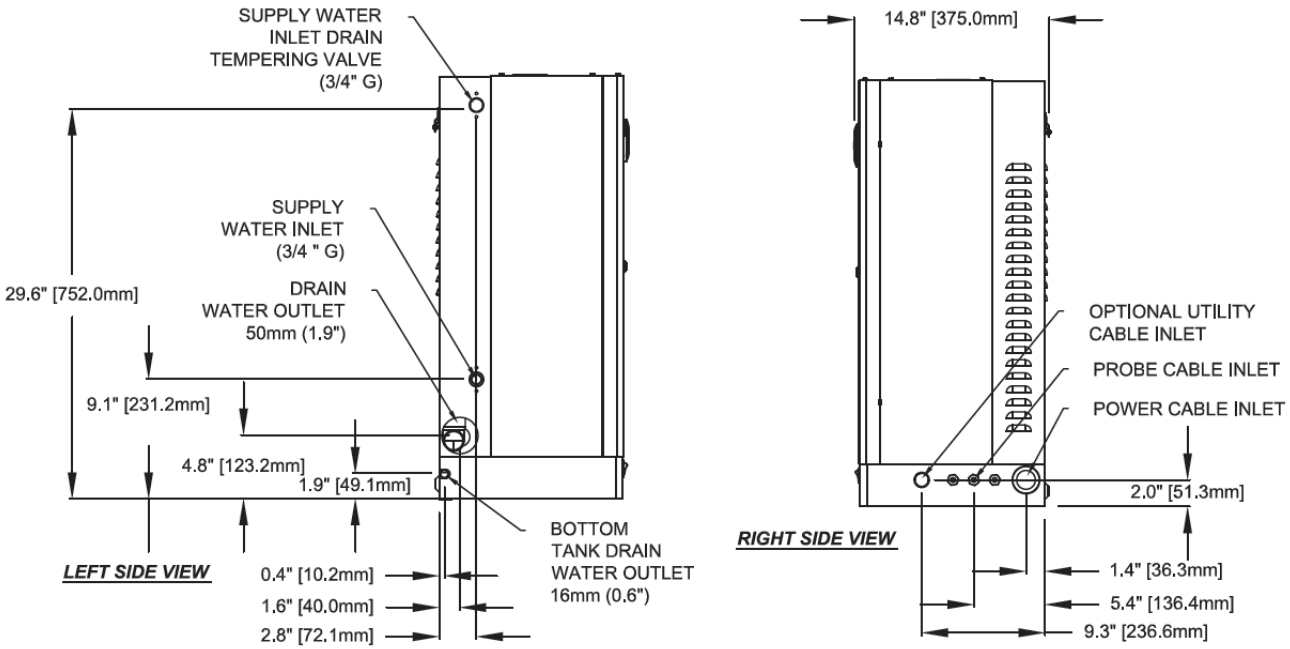


Fig. 1.h

distance mm (in)	Models UE090 to UE130
X	150 (5.9)
Y	735 (28.9)
Z	850 (33.5)


CONDENSATE DRAIN
(3/8")
7.1" [181.0mm]
2.2" [55.0mm]
6.8" [172.0mm]
1.2" [30.2mm]
STEAM OUTLET
40mm (1.6")
TOP VIEW


21.5" [545.0mm]
CONTROL
32.1" [815.0mm]
FRONT VIEW
ON/OFF SWITCH



CAREL www.carelusa.com www.humidifynow.com	DESCRIPTION: humiSteam Models 025-045Kg/h	PAGE NUMBER: 3/3
	DOCUMENT CODE: TD_UEX_1013	REV: R1

Only use main water with:
• pressure between 0.1 and 0.8 MPa (14.5 and 116 PSI), temperature between 1 and 40 °C (33.8 and104 °F) and an instant flow-rate no lower than the rated flow of the fill solenoid valve, the connection is G3/4M
• range hardness 10° to 40 °f (equal to 400 ppm of CaCO3), conductivity: 75 to 1250 µS/cm;
• no organic compounds.

supply water characteristics	unit of measure	normal water		water with low salt content	
		min.	max.	min.	max.
Hydrogen ions (pH)		7	8.5	7	8.5
Specific conductivity at 20°C ($\sigma_{R,20°C}$)	µS/cm	300	1250	75	350
Total dissolved solids (c_R)	mg/l	(1)	(1)	(1)	(1)
Dry residue at 180°C (R_{180})	mg/l	(1)	(1)	(1)	(1)
Total hardness (TH)	mg/l $CaCO_3$	100 (2)	400	50 (2)	150
Temporary hardness	mg/l $CaCO_3$	60 (3)	300	30 (3)	100
Iron + Manganese	mg/l Fe+Mn	=	0.2	=	0.2
Chlorides	ppm Cl	=	30	=	20
Silica	mg/l SiO_2	=	20	=	20
Residual chlorine	mg/l Cl-	=	0.2	=	0.2
Calcium sulphate	mg/l $CaSO_4$	=	100	=	60
Metallic impurities	mg/l	0	0	0	0
Solvents, thinners, detergents, lubricants	mg/l	0	0	0	0

(1)= values depend on the specifi c conductivity; in general: TDS □0,93 * σR, 20 °C; R180 □ 0,65 * σR, 20 °C
(2) = not less than 200% of the chloride content in mg/l CL
(3) = not less than 300% of the chloride content in mg/l CLThere is not reliable relationship between hardness and conductivity of the water.

Important:Important:
• do not treat the water with softeners, this may cause foam, aff ecting the operation of the unit;
• do not add disinfectants or anticorrosive compounds to the water, as these are potential irritants;
• the use of well water, industrial water or water from cooling circuits and, in general, any potentially chemically or bacteriologically contaminated

Supply Water Technical specifications

Water Technical Specifications	UE025	UE035	UE045	UE065	UE090	UE130
CONNECTION	3/4" G					
temperature limits °C (°F)	1 to 40 (33.8 to 104)					
pressure limits MPa (PSI)	0.1 to 0.8 (1 to 8 bar)(14.5 to 116.0)					
instant flow-rate l/min (GPM)	5.85 (1.3) 7 (1.5) for UE045 to 230Vac)			7 (1.5)	14 (3.0)	
conductivity range (µS/cm)	75 to 1250					

Plumbing

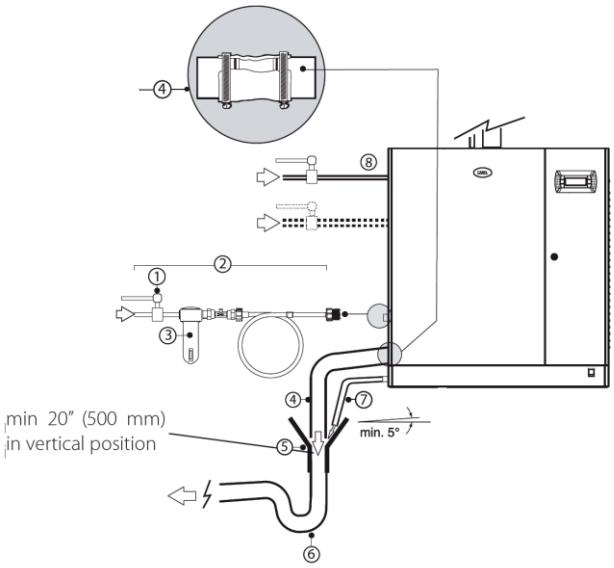
Water drain
• this contains the same substances dissolved in the supply water, however in larger quantities;
• it may reach a temperature of 100 °C (212 °F);
• it is not toxic and can be drained into the sewerage system.

Drain tempering

The unit is fitted with a tempering valve that, opening at the same time as the drain valve, adds cold water to the drain line, thus ensuring a maximum temperature of the drain water of 60°C/140°F.

Drain Water Technical specifications

Drain Water Technical Specifications		UE025	UE035	UE045	UE065	UE090	UE130
connection dia. mm (in)		50 (1.9)					
typical temperature °C (°F)	≤100 (212)						
Drain tempering temperature °C (°F)	≤ 60/ (140)						
instant fl ow-rate (l/min) (GPM)		22.5 (5.9)				45 (11.8)	
instant fl ow-rate of the drain tempering valve		30 (7.9)				30 (7.9)	



1. Install a manual valve upstream of the installation (to be able to shut off the water supply)
2. On models UE025 to UE130 connect the hose with the back flow preventer supplied (code FWHDCV0000) to prevent the water inside the humidifier from coming into contact with the main water
3. Install a mechanical filter to trap any solid impurities (to be connected downstream of the manual valve)
4. Connect a section of non-conductive pipe or hose for draining (resistant to temperatures of 100 °C (212 °F) and with a minimum 50 mm/1.9" for models UE025 to UE130)
5. Prepare a funnel to interrupt continuity in the drain line funnel for required air gap, can be composed of a piping reducer
6. Connect a drain trap to prevent the return of bad odors (minimum inside diameter 50 mm/1.9" for models UE025 to UE130)
7. In models UE025 to UE130: connect a drain hose from the bottom tank of the humidifier (this can run into the drain funnel/air gap reducer coupling)
8. in models UE025 to UE130: connect the hose FWH3415HT0 for the drain tempering valve. Double cylinders UE090-130 require (2) provided hoses.

Steam Distribution

Steam Hose

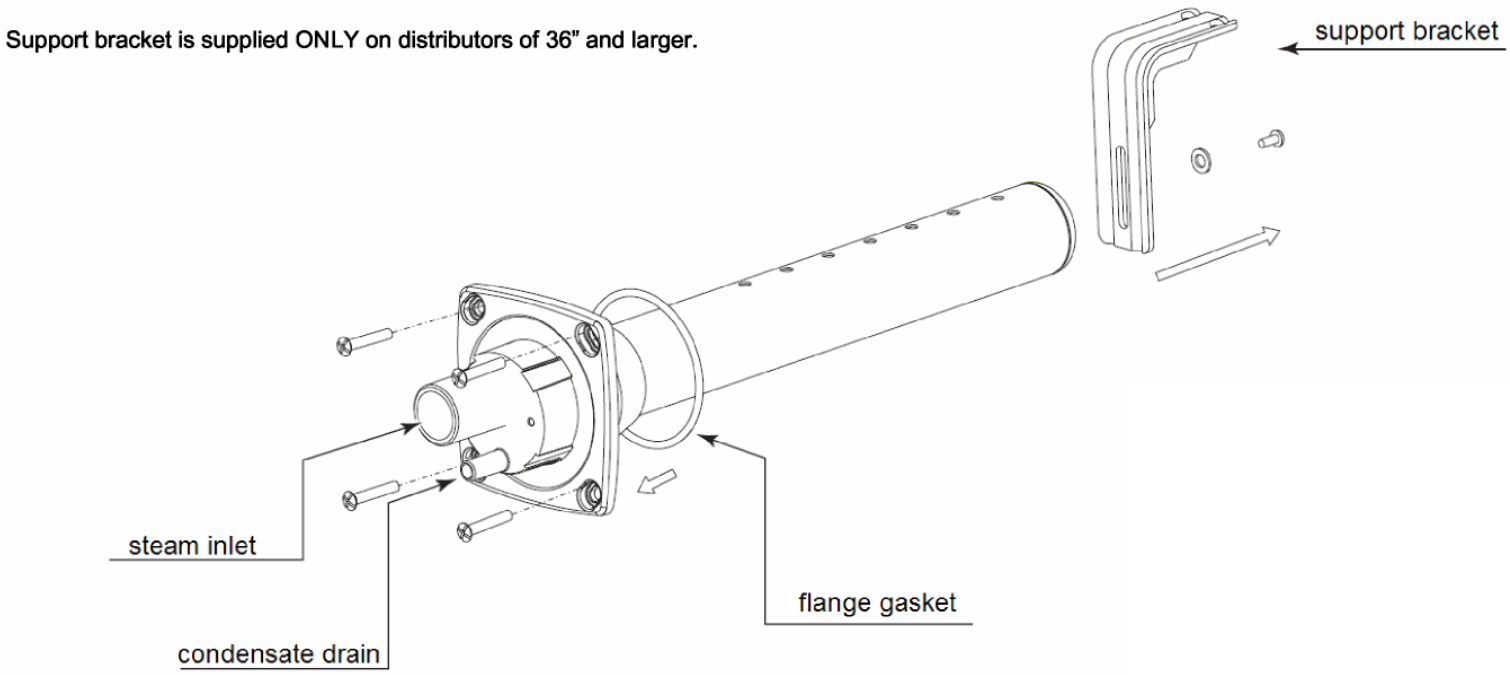
The hose is also rated for food use, which makes it acceptable to food and pharmaceutical applications. The composition is EPDM rubber with a polyester braid, containing no silicone.

Ordering Code	Description	I.D. mm	I.D. inches	I.D. mm	I.D. inches
CHOSE00516	Rubber condensate hose, 5/16"	7.94	0.31	15.9	0.63

CHOSE00038	Rubber condensate hose, 10 mm	9.52	0.38	17.5	0.69
SHOSE00022	Rubber steam hose, 22 mm	22	0.87	31.5	1.24
SHOSE00030	Rubber steam hose, 30 mm	30	1.18	40.5	1.59
SHOSE00040	Rubber steam hose, 40 mm	40	1.57	52	2.05

Steam Distributor

NOTE: Support bracket is supplied ONLY on distributors of 36" and larger.

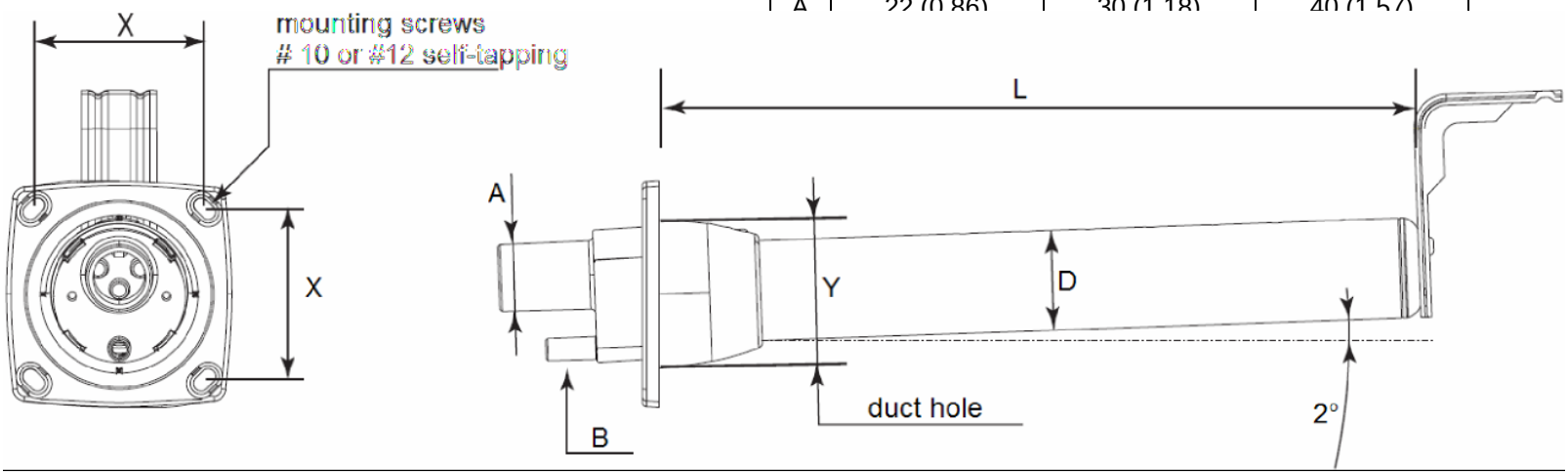


Steam Distribution

Steam Distributor

Submittal Data

	Dimension mm (inches)		
A	22 (0.86)	30 (1.18)	40 (1.57)

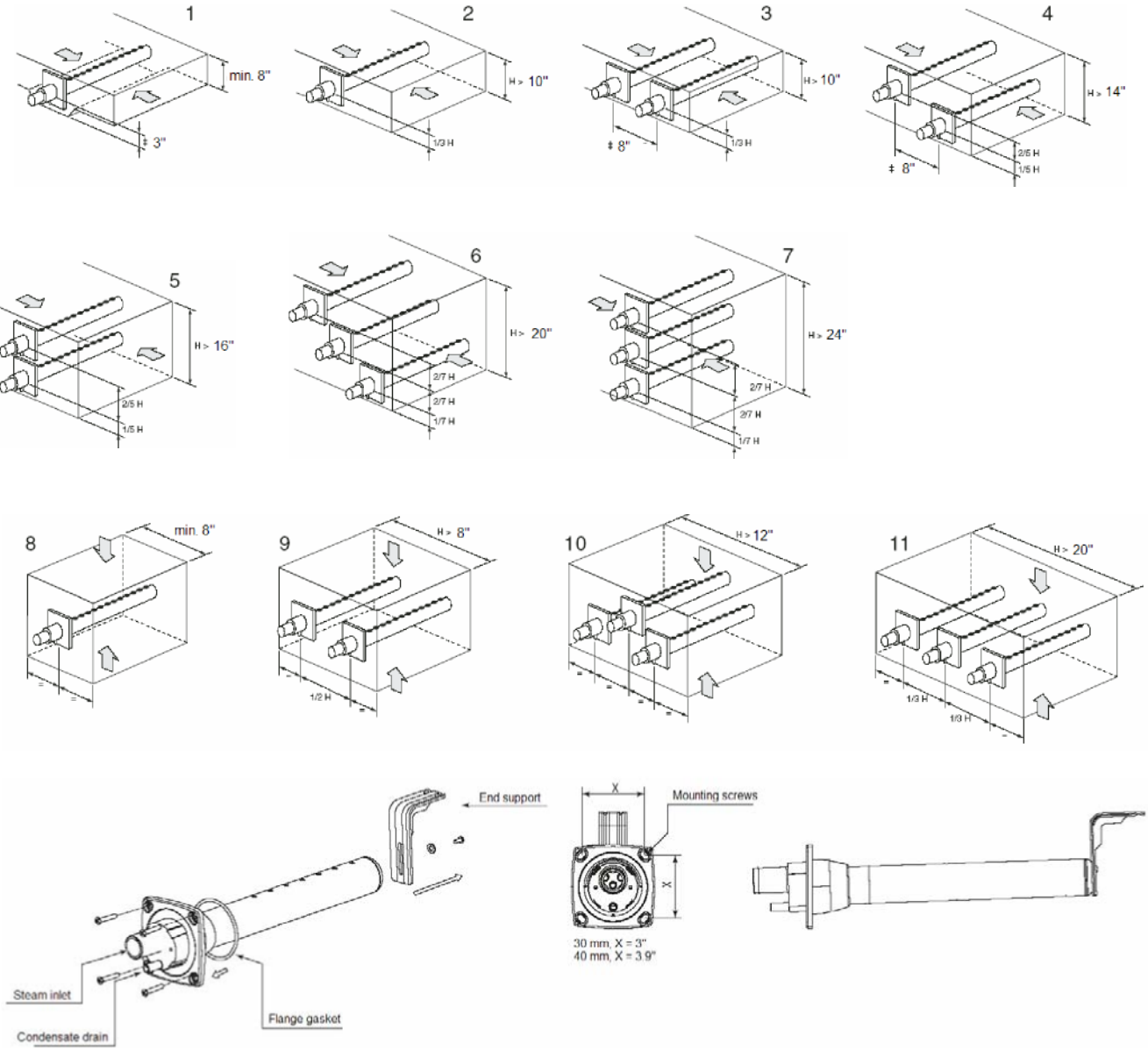


Distributor	mm (inches)
DP030D22RU	299 (11.77)
DP035D22R0	332 (13.07)
DP045D22R0	438 (17.24)
DP060D22R0	597 (23.5)
DP085D22R0	835 (32.87)
DP030D30RU	299 (11.77)
DP035D30R0	343 (13.5)
DP045D30R0	427 (16.81)
DP060D30RU	599 (23.58)
DP060D30R0	596 (23.46)
DP085D30R0	850 (33.46)
DP105D30R0	1047.5 (41.24)
DP125D30R0	1244.8 (49)
DP165D30R0	1639 (64.53)
DP060D40RU	599 (23.58)
DP085D40R0	833.4 (32.81)
DP105D40R0	1014.7 (39.95)
DP125D40R0	1221.9 (48)
DP165D40R0	1636.3 (64.42)
DP205D40R0	2024.8 (79.72)

Steam distribution

Duct injection

Distributor pipes should be mounted per the diagrams shown below, with a minimum of 6” from the center of the distributor pipe to the top of the duct and 3” minimum to the bottom.



IMPORTANT: Allow 2 feet of straight duct downstream of the distributor pipes when the air temperature will be >55°F. Allow 3 feet of straight duct if the air temperature will be <50°F. Always allow 2 feet upstream. Turbulent air flow may require longer lengths.

Steam Distribution

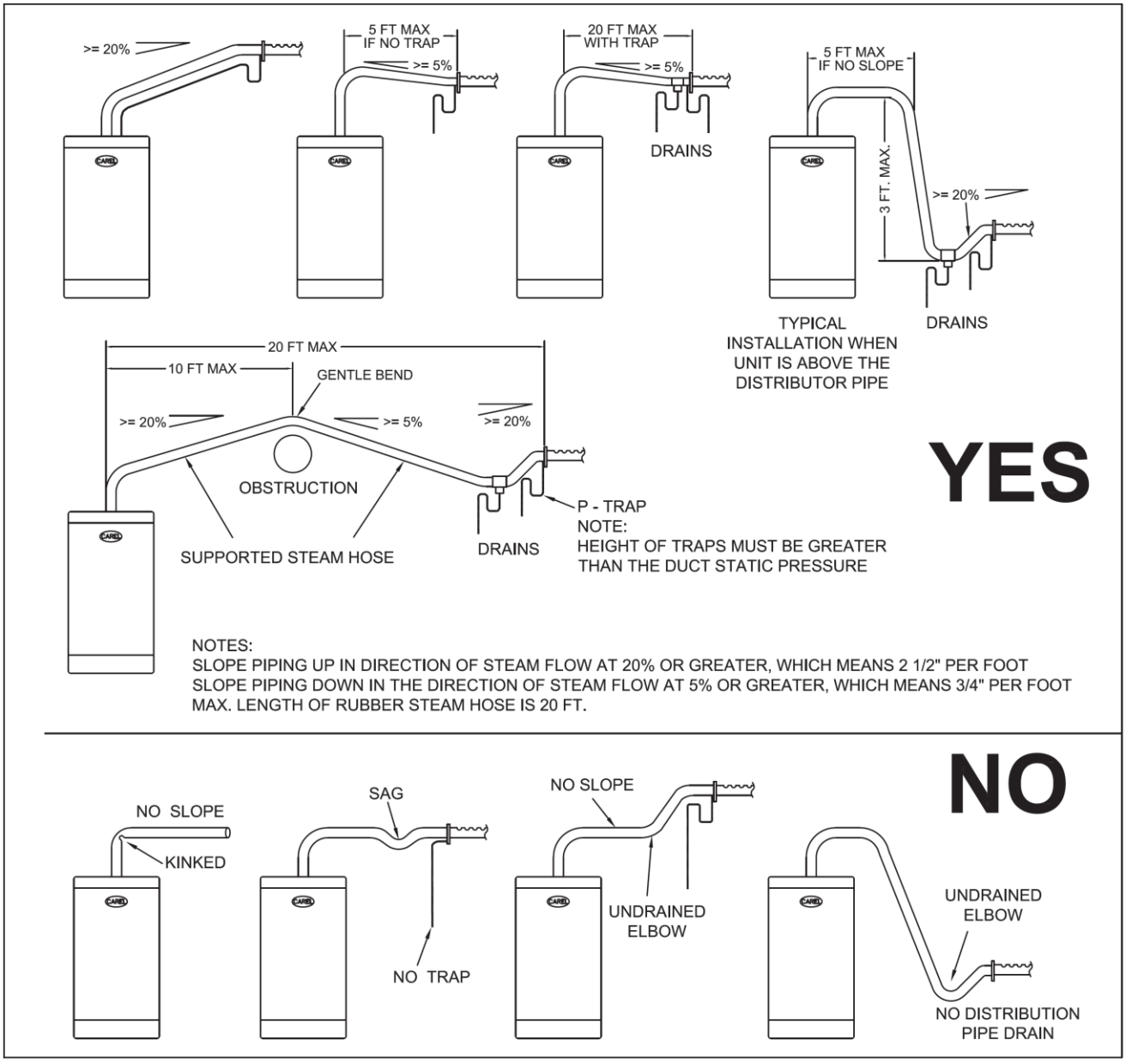
NINETY PERCENT (90%) OF ALL OPERATION PROBLEMS ARE CREATED BY IMPROPER STEAM PIPING FROM THE HUMIDIFIER UNIT TO THE DUCT DISTRIBUTOR PIPES.

To avoid these problems, remember one simple fact when running the steam hose: steam naturally flows up hill, and condensate naturally flows down hill.

Nothing must impede the free flow of either steam to the distributor pipes or condensate back to the unit or the drain. If SS tubing is used, use two 45° angles or sweeping elbows rather than sharp 90° elbows.

Follow one simple rule: Run the steam hose or piping to avoid any kinks, sharp elbows, or low spots that could collect or restrict the flow of steam to the distributor pipe, or the flow of condensate back to the humidifier. Support the hose adequately to avoid sags.

The following diagrams are to provide you with some guidelines. If you have a situation you are unsure of, *please* contact the factory for instructions.

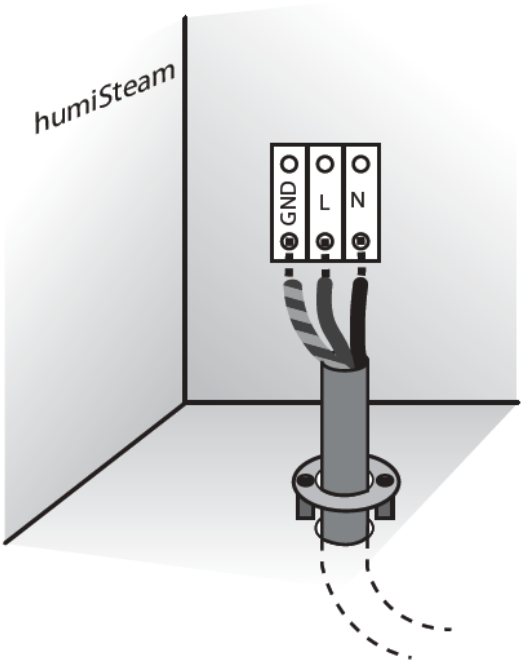


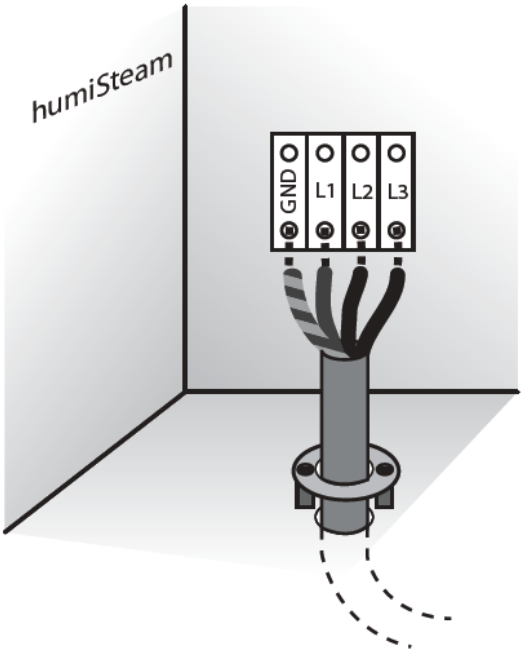
Power wiring

The HumiSteam units contain field wiring terminals for connection of high power.

All wiring must be in accordance with local, state and national electric codes.

NOTE: to avoid unwanted interference, the power cables should be kept separate from any control wiring.





Electrical Specifications

model	steam production [2, 4] (kg/hr) (lbs/hr)	power[2] (kW)	power supply code	power supply voltages[1] (V - type)	current[2] (A)	nominal specifications TAM configuration[5]		cable[3] (mm²) / (AWG)	recommended External fuses sizes[3] (A / type)	wiring diagram (Fig.)
UE018	18 / 39.7	13.5	M	460 - 3~	16.9	13.a	500	6 / 10	32 A / fast blow	12.2
			N	575 – 3~	13.57	13.a	500	6 / 10	32 A / fast blow	12.2
UE025	25 / 55.1	18.7	W	208 - 3~	52.0	13.b	500	25 / 3	80 A / fast blow	12.3
			K	230 – 3~	47.1	13.b	500	25 / 3	63 A / fast blow	12.3
			M	460 - 3~	23.5	13.c	500	10/8	32A / fast blow	12.3
			N	575 – 3~	18.8	13.c	500	6/10	25A / fast blow	12.3
UE035	35 / 77.2	26.2	W	208 - 3~	72.9	13.c	700	35 / 4	100 A / fast blow	12.3
			K	230 – 3~	65.9	13.c	700	35 / 4	100 A / fast blow	12.3
			M	460 - 3~	32.9	13.c	500	16 / 6	50 A / fast blow	12.3
			N	575 – 3~	26.4	13.c	500	10/8	40 A / fast blow	12.3
UE045	45 / 99.2	33.7	W	208 - 3~	93.68	13.b	700	70 / 2	125 A / fast blow	12.4
			K	230 – 3~	84.72	13.b	700	70 / 2	125 A / fast blow	12.4
			M	460 - 3~	42.4	13.c	700	16 / 6	60 A / fast blow	12.3
			N	575 – 3~	33.9	13.c	700	16 / 6	50 A / fast blow	12.3
UE065	65 / 143.3	48.7	M	460 - 3~	61.19	13.b	700	35 / 4	100 A / fast blow	12.4
			N	575 – 3~	48.95	13.b	700	35 / 4	80 A / fast blow	12.4
UE090	90 / 198.4	67.5	M	460 - 3~	84.72	13.c	700	50 / 2	100 A / fast blow	12.5
			N	575 – 3~	67.78	13.c	700	35 / 2	80 A / fast blow	12.5
UE130	130 / 286.6	97.5	M	460 - 3~	122.37	13.b	700	95 / 1/0	160 A / fast blow	12.5
			N	575 – 3~	97.90	13.b	700	70 / 1/0	125 A / fast blow	12.5

1. Tolerance allowed on the rated mains voltage: -15%, +10%;
2. Tolerance on the rated values: +5%, -10% (EN 60335-1)
3. Recommended values refer to laying PVC or rubber cables in closed conduits, 20 m (65.6 feet) long; use the local standards, or whichever is more restrictive
4. Rated max instant steam production: the average steam production may be affected by external factors, such as: ambient temperature, water quality, steam distribution system
5. Refer to the wiring diagrams to verify the data are not absolute and if these differ from local standards, the latter must prevail.

Control Wiring

A typical humidifier control system includes a wall or return duct sensor or controller, a high limit duct humidistat, and an air-proving switch. Placement of these devices is critical to proper operation of the overall system.

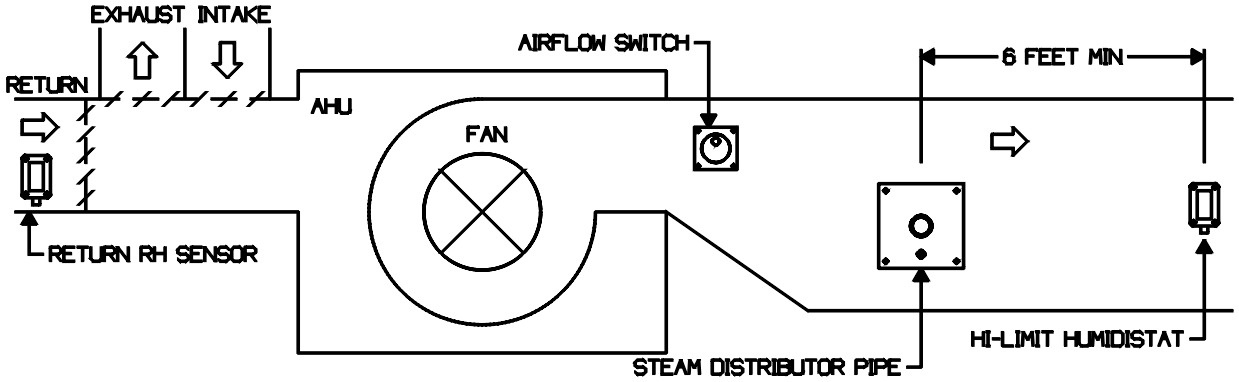
Controls Placement

(see following diagram)

The return air RH sensor must always be located BEFORE any outside air intake, in order to insure accurate sensing of the air from the space. Alternatively, a room RH sensor or humidistat can be used. Room sensors should be located on an inside wall or post and should not be hit by any discharge air streams from ducts. In a 100% outside air system, the RH sensor may be placed in the supply duct, at least 10 feet down stream of the distributor pipe to act as both hi-limit and control.

The airflow switch must be positioned to accurately open on a loss of airflow, to prevent the humidifier from running when there is no air to absorb the moisture.

The hi-limit humidistat must be positioned far enough down stream of the steam distributor pipe(s) to prevent it from getting wet, but still allow it to accurately prevent over humidification of the duct that could result in condensation.

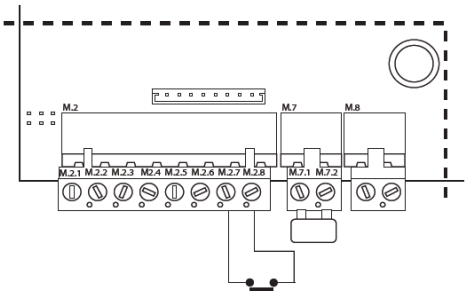


Controls wiring

Depending on the type of signal used, steam production can be enabled and/or managed in different ways.

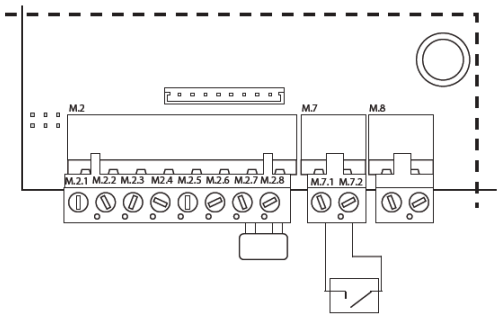
REMOTE CONTACT (ON/OFF action)

- jumper outputs M7.1 and M7.2
- connect outputs M2.7 and M2.8 to a remote contact (e.g.: switch, timer,…)



HUMIDISTAT (ON/OFF action)

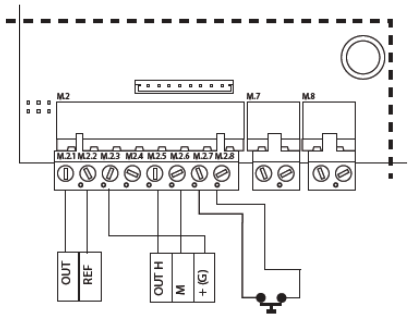
- connect outputs M7.1 and M7.2 to a humidistat
- jumper outputs M2.7 and M2.8



PROPORTIONAL EXTERNAL CONTROLLER WITH CAREL LIMIT PROBE

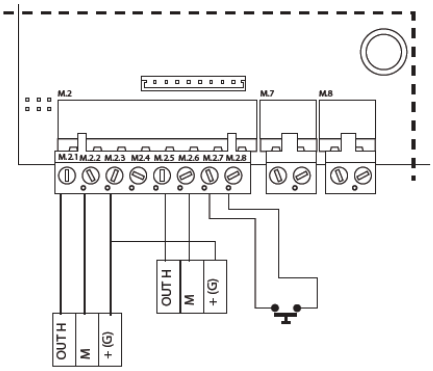
- jumper outputs M2.7 and M2.8 or connect to a remote contact
- connect the limit probe to terminals M2.3, M2.5 and M2.6
- The humidifier can be programmed to receive one of the following signals:

Voltage: 0 to 1 Vdc, 0 to 10 Vdc, 2 to 10V
Current : 0 to 20 mA, 4 to 20 mA
Potentiometric: 135-1000 ohm, 0-135 ohm

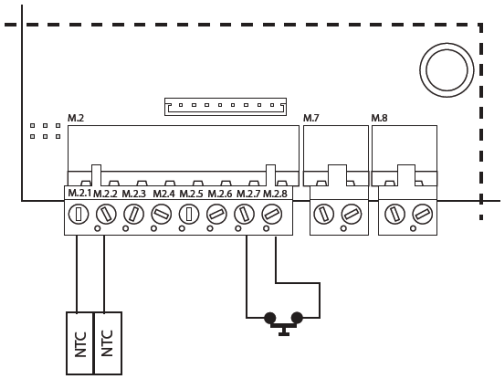


CONTROL WITH CAREL MAIN PROBE AND LIMIT PROBE

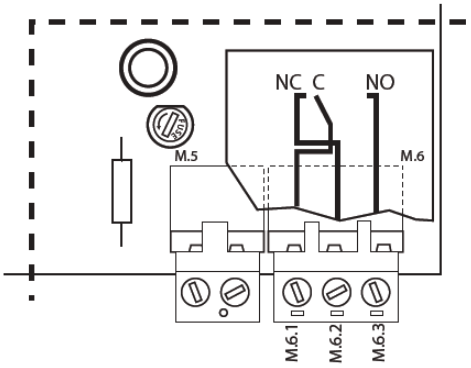
- jumper outputs M2.7 and M2.8 or connect to a remote contact
- connect the main probe to terminals M1.2, M2.2 and M2.3
- connect the limit probe to terminals M2.3, M2.5 and M2.6



CAREL NTC probe connection:



Contact available for the remote signalling of one or more alarms.



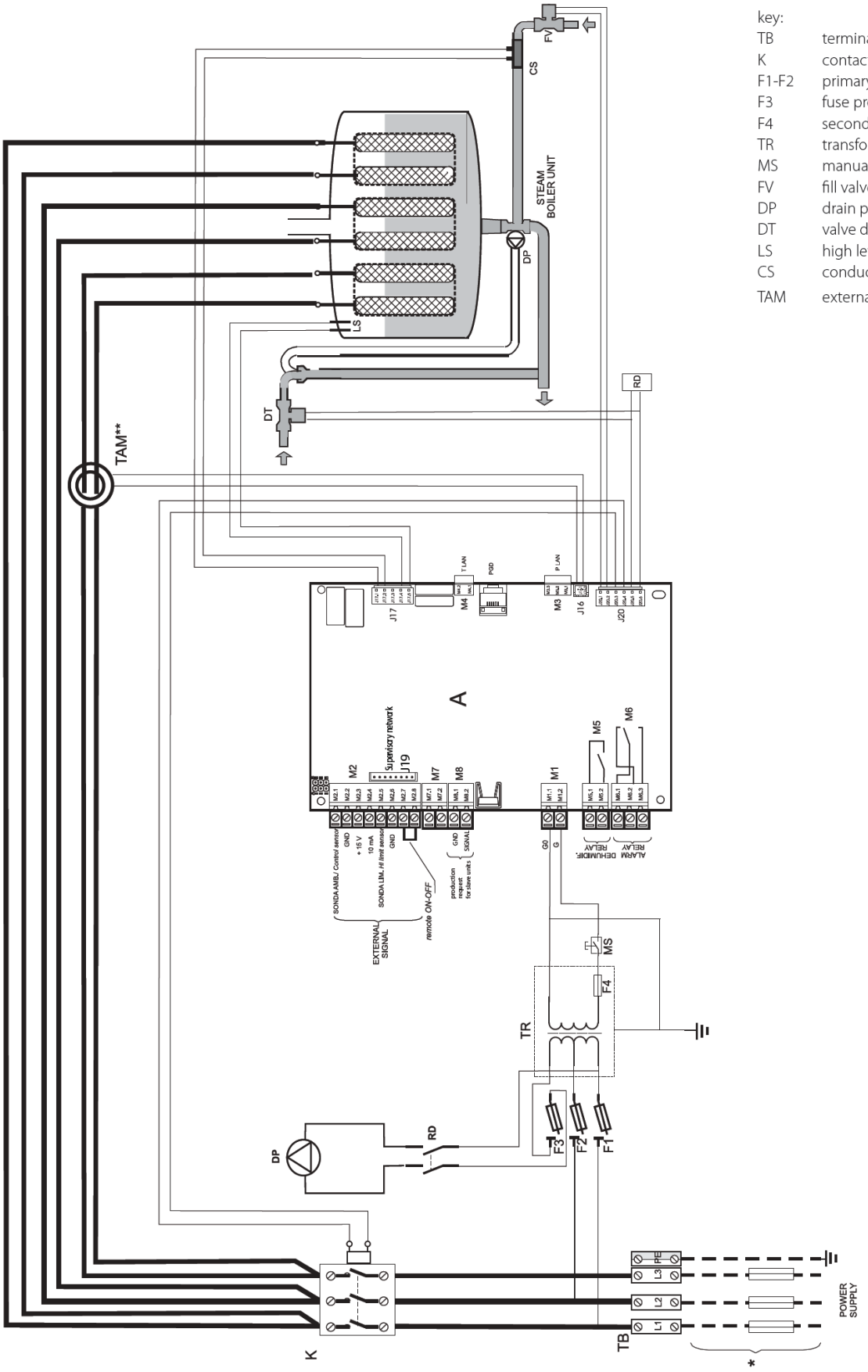
If non-CAREL probes are used, check:

- voltage signal: 0 to 1 Vdc, 0 to 10 Vdc, 2 to 10 Vdc, terminal M2.1 (GND: M2.2);
- current signal: 4 to 20, 0 to 20 mA, terminal M2.4 (GND: M2.6).

In addition, depending on the type of power supply:

- +15 V, terminal M2.3;
- + 1 Vdc 135 ohm, terminal M2.4.

Diagram of three-phase models UE025(208-230-460-575V), UE35(208-230-460-575V) and UE045(460-575V)



key:

TB	terminal block
K	contactor
F1-F2	primary fuses
F3	fuse protection drain pump
F4	secondary fuse
TR	transformer
MS	manual switch
FV	fill valve
DP	drain pump
DT	valve drain tempering
LS	high level electrodes
CS	conductivity meter
TAM	external TAM

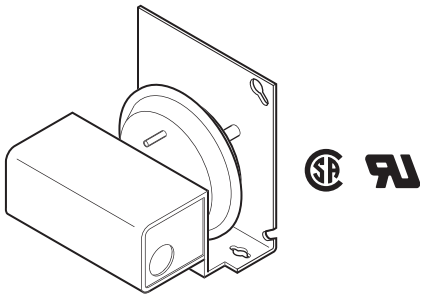
Technical Specifications

technical specifications		UEX models							
			UE025**	UE035**	UE045**	UE065**	UE090**	UE130**
steam								
connection dia. mm (in)	208-230 V		1x40 (1x1.6)		2x40 (2x1.6)	--	--	--
	460 -575V		1x40 (1x1.6)			2x40 (2x1.6)	2x40 (2x1.6)	4x40 (2x1.6)
outlet pressure limits Pa (PSI) (" W.C.)			0/2000 (0/0.290) (8.0)					
supply water								
connection		3/4" G						
temperature limits °C (°F)		1 to 40 (33.8 to 104)						
pressure limits MPa (PSI)		0.1 to 0.8 (1 to 8 bar) (14.5 to 116.0)						
hardness limits (°fH)		≤ 40						
instant flow-rate l/min (GPM)			5.85 (1.3) (7 (1.5) for UE045 to 230Vac)			7 (1.5)	14 (3.0)	
conductivity range (µS/cm)		75 to 1250						
drain water								
connection dia. mm (in)			50 (1.9)					
typical temperature °C (°F)		≤100 (212)						
Drain tempering temperature °C (°F)		≤ 60/ (140)						
instant flow-rate (l/min) (GPM)			22.5 (5.9)				45 (11.8)	
instant flow-rate of the drain tempering valve			30 (7.9)				30 (7.9)	
environmental conditions								
ambient operating temp. °C (°F)		1 to .40 (33.8 to 104)						
ambient operating humidity (% rH)		10 to 60						
storage temperature °C (°F)		-10 to 70 (14 to 158)						
storage humidity (% rH)		5 to 95						
index of protection		IP20						
electronic controller								
controller		UEX*******						
auxiliary voltage/frequency (V - Hz)		24 / 50/60						
maximum auxiliary power (VA)		90						
probe inputs (general features)		can be selected for the following signals: 0 to 1 Vdc, 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20 mA, 4 to 20 mA, NTC, 135-1000 ohm, 0-135 ohm. input impedence: 60 kΩ with: 0 to 1 Vdc, 0 to 10 Vdc, 2 to 10 Vdc signals 50 Ω with: 0 to 20 mA, 4 to 20 mA signals						
active probe power supply (general features)		15 Vdc. 100 mA protected against short-circuits +1 Vdc with 135 Ω load						
alarm relay outputs(general features)		250 V 5 A (2 A) - type of action-microswitching 1C						
remote enable input (general features)		voltage-free contact; max. resistance 50 Ω; Vmax= 24 Vdc; Imax= 6 mA						
output								
instant steam production[1] kg/h (lb/h)			25 (55.1)	35 (77.2)	45 (99.2)	65 (143.3)	90 (198.4)	130 (286.6)
power input at rated voltage (kW)			18.75	26.25	33.75	48.75	67.5	97.5

Product Documentation for: PC-301 Sensor

Two-Position Air Flow Pressure Switch

This switch provides low or line voltage control of pressure for air and non-combustible gases. It controls static pressure, total pressure, or differential total pressure.



Features:

- High/low pressure taps.
- Adjustable from 0.07 to 1 in. (1.8 to 25.4 mm) W.C.
- Universal mounting.
- Agency approved.

Model Chart

Model No.	Description
PC-301	Refer to Specifications.

Specifications

Setpoint	
Factory setting	0.07 in. (1.8 mm) W.C.
Field adjustment	0.07 to 1 in. (1.8 to 25.4 mm) W.C.
Sensing element	Neoprene diaphragm.
Differential	0.04 in. (1 mm) W.C. at minimum setpoint to 0.1 in. (3 mm) W.C. at maximum setpoint.
Environment	
Ambient temperature limits	Shipping and storage: -40 to 140°F (-40 to 60°C). Operating: 35 to 140°F (2 to 60°C).
Humidity	5 to 95% RH, non-condensing.
Locations	NEMA Type 1.
Maximum pressure	12 in. (305 mm) W.C.
Electrical switch	
Type	Snap action SPDT.
Ratings	Refer to Maximum Electrical Switch Ratings Table.
Connections	Refer to Figure 1.
Wiring	Coded screw terminals.
High pressure taps	One barbed fitting for 3/8 in. O.D. plastic tubing.
Low pressure taps	One barbed fitting for 1/4 in. O.D. plastic tubing.
Case	All metal with 1/2 in. conduit opening.
Mounting	In vertical position on any surface free of vibration.
Dimensions	6-3/8 H x 4-3/4 W x 4-3/8 D in. (162 x 121 x 111 mm).
General Instructions	Refer to F-16160.

Maximum Electrical Switch Ratings.

Vac	Full Load Amps	Locked Rotor Amps	Pilot Duty (VA)	Non-Inductive Amps
24 V	—	—	60	—
120 V	6.25	37.5	300	
240 V	3.1	18.6		
277 V	2.7	16.2		10

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Accessories

Model No.	Description
AP-302	Duct static pressure sensing tip for pressure 1 in. (25.4 mm) W.C. and up.
AP-305	Duct static pressure sensing tip for pressure 0.01 in. (0.3 mm) W.C. and up.
AT-208	Duct mounting bracket for probes other than AP-302 and AP-305.

Typical Applications

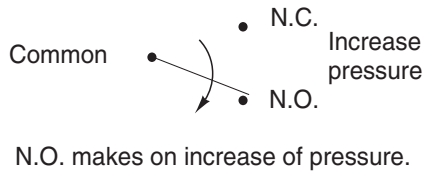

Figure 1 Switch Action for PC-301 Switch.

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Product Documentation for: DPDC Sensor

DPD* / DPP Sonde da condotta / Duct probe (DPD* DPP*) / sondes pour conduite (DPD* DPP*) / Leitungsfühler (DPD* DPP*) / Sondas para conducto (DPD* DPP*)

LEGGI E CONSERVA QUESTE ISTRUZIONI
READ AND SAVE THESE INSTRUCTIONS

CAREL

Dimensioni sonde condotta (DPD) / Duct (DPD) probes dimension / Dimens. sondes pour conduite (DPD) / Abmessungen Leitungsfühler (DPD) / Dimensiones del conducto (DPD)

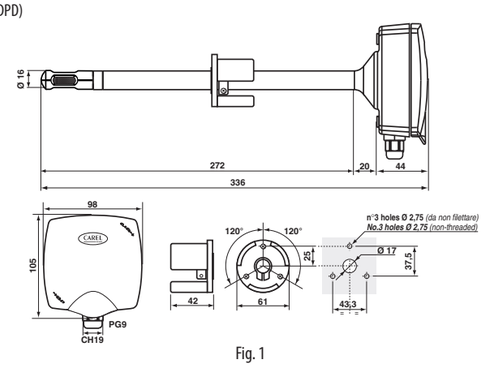


Fig. 1

Sonde Amb.Tecnico (DPP) / General pourpose (DPP) probes / Sondes pour milieu technnique (DPP) / Fühler für technische Installationen (DPP) / Sondas para Amb. Técnico (DPP)

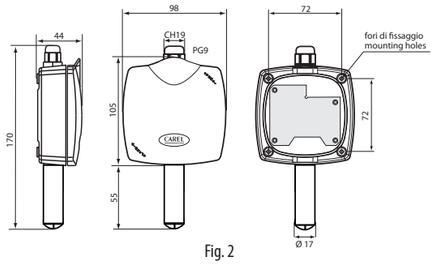
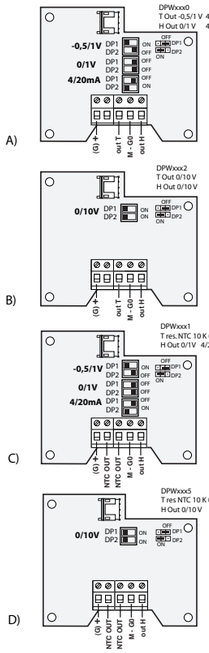


Fig. 2

Collegamenti/ *Connections*/ Branchements/ *Anschlüsse*/ Conexiones



Avvertenze: - uscita -0,5...1 V carico>di 1 Kohm
- uscita 4...20 mA carico<=100 Ohm
- uscita 0...10 V carico>1 Kohm
- Per i codici DPWxxx 0 e 1 il tipo di uscita e' definito dai DP1 e 2 come indicato
- Per i codici DPWxxx 2 e 5 con uscita 0-10 V DP1 e 2 non si modificano.

Legenda: OUT/H: uscita temperatura/umidità -0,5...1V 4...20mA
M-G0 : riferimento segnale ed alimentazione
(G)+ : alimentazione 12...24 Vac, 8...32 Vdc per versioni 0...10V 24Vac/18...32 Vdc
NTC OUT : connessione NTC resistivo

Warnings: - 0.5...1 V output load > 1 KOhm
- 4...20 mA output load <= 100 Ohm
- 0...10 V output load > 1 KOhm
- For codes DPWxxx 0 and 1 the type of output is defined by DP1 and 2 as indicated
- For codes DPWxxx 2 and 5 with 0-10 V output DP1 and 2 are not modified.

Key: OUT T/H: -0.5...1V 4...20mA temperature/humiditysoutput
M-G0: signal and power supply reference
(G)+: 12...24 Vac power supply, 8...32 Vdc for 24Vac 18...32 Vdc 0...10V versions
NTC OUT : NTC resistive connection

Remarques: - sortie -0,5 / 1 V charge > de 1 Kohm
- sortie 4 / 20 mA charge <= 100 Ohm
- sortie 0 / 10 V charge > 1 Kohm
- Pour les codes DPWxxx 0 et 1 le type de sortie est défi ni par les DP1 et 2 comme indiqué
- Pour les codes DPWxxx 2 e 5 avec sortie 0-10 V DP1 et 2 ne changent pas.

Légende: OUT T/H: sortie température/humidité -0,5...1V 4...20mA
M-G0: référence signal et alimentation
(G)+ : alimentation 12...24 Vac, 8-32 Vdc pour versions 0...10V 24Vac/18...32 Vdc
NTC OUT : connexion NTC résistif

Hinweise: - 0,5...1 V-Ausgang Last > 1 Kohm
- 4...20 mA-Ausgang Last <= 100 Ohm
- 0...10 V-Ausgang Last > 1 Kohm
- Für die Produktcodes DPWxxx 0 und 1 wird der Ausgangstyp von den DP1 und 2 wie angegeben bestimmt.
- Für die Produktcodes DPWxxx 2 und 5 mit 0...10 V-Ausgang ändern sich DP1 und 2 nicht.

Legende: OUT T/H: Temperatur-/Feuchteausgang
-0,5...1 V 4...20mA
M-G0: Masse für Signal und Versorgung
(G)+: Versorgung 12...24 Vac, 8...32 Vdc für Versionen 0...10V 24Vac/18...32 Vdc
NTC OUT: Anschluss NTC ohmsch

Advertencias: - salida -0,5...1 V carga > 1 Kohm
- salida 4...20 mA carga <= 100 Ohm
- salida 0...10 V carga > 1 Kohm
- Para los códigos DPWxxx 0 y 1 el tipo de salida está definido en DP1 y 2 como se indica
- Para los códigos DPWxxx 2 y 5 con salida 0...10 V DP1 y 2 no se modifican.

Leyenda: OUT T / OUT H: salida temperatura/ humedad -0,5...1V 4...20mA
M-G0: referencia señal y alimentación
(G)+: alimentación 12...24 Vca, 8...32 Vcc para versiones 0...10V 24Vca/18...32 Vcc
NTC OUT: conexión NTC resistivo

Fig. 3

(I)

Caratteristiche generali

Le sonde elettroniche CAREL serie DP sono dispositivi per applicazioni nei settori di condizionamento e trattamento aria, riscaldamento e refrigerazione, in abbinamento con i relativi controlli CAREL. Sono disponibili le versioni per ambiente, ambiente tecnico e per condotta. Si differenziano per il montaggio, per il tipo di uscita di segnale e per i modelli: temperatura, umidità o combinati. Sono disponibili anche versioni con uscita di temperatura con NTC resistivo. Rispetto alla famiglia AS presentano notevoli migliorie per la precisione di misura di temperatura ed umidità. La configurazione dei dip-switch (DP1, 2) permette la selezione del segnale di uscita per la connessione a controlli CAREL o altri, come indicato in fig. 3 :

Uscite Temperatura/Umidità **in tensione** -0,5V...+1V 0...1V 0...10V
in corrente 4...20mA

Entrambi i canali si configurano nello stesso modo, non sono possibili connessioni miste delle uscite. Alcuni codici prevedono la connessione diretta del sensore di temperatura NTC, indicate come NTC res. La versione con uscite 0...10V é un codice specifico non configurabile diverso da 0...10 V (DP1, 2 sono bloccati).

Sonde da condotta DPD*

Utilizzo in impianti di riscaldamento e condizionamento che usano condotte.

Codice	Descrizione	Range	Sostituisce
DPDT010000	sonda di temperatura a condotta con uscita 0...1VDC - 4...20mA	-20T70 °C	ASDT030000
DPDT011000	sonda di temperatura a condotta (uscita res. NTC)	-20T70 °C 10...90% rh	
DPDC111000	sonda di temperatura e umidità a condotta con uscita NTC res./ uscita 0...1VDC, 4...20mA	-10T60 °C 10...90% rh	ASDC111000
DPDC110000	sonda di temperatura e umidità a condotta con uscita 0...1VDC, 4...20mA	-10T60 °C 10...90% rh	ASDC110000 ASDH100000
DPDC112000	sonda di temperatura e umidità a condotta (uscita 0...10VDC) / rh 10...90% (uscita 0...10VDC)	-10T60 °C 10...90% rh	
DPDC210000	sonda di temperatura e umidità a condotta con uscita 0...1VDC - 4...20mA / rh uscita 0...1VDC - 4...20mA	-20T70 °C 0...100% rh	ASDC230000 ASDH200000
DPDC211000	sonda di temperatura e umidità a condotta (uscita res. NTC) rh 0...100% (uscita 0=1 UDC- 4...20mA)	-20T70 °C 0...100% rh	
DPDC212000	sonda di temperatura e umidità a condotta 0...10V / uscita 0...10VDC	-20T70 °C 0...100% rh	
DPDT011000 (*)	sonda di temperatura NTC resistiva	-20T70 °C	ASDT011000

(*) : Per il collegamento elettrico, vedi etichetta riportata sul sensore

Sonde da ambiente tecnico DPP*

Utilizzo in impianti tecnici (celle di conservazione, piscine, . .)

Codice	Descrizione	Range	Sostituisce
DPPT010000	sonda per ambiente tecnico con uscita 0...1VDC – 4...20mA	-20T70 °C	
DPPT011000	sonda per ambiente tecnico (uscita res. NTC)	-20T70 °C	
DPPC111000	sonda di temperatura e umidità per ambiente tecnico con uscita res. NTC / 0...1VDC - 4...20mA	-10T60 °C 10...90% rh	
DPPC110000	sonda di temperatura e umidità per ambiente tecnico con uscita 0...1VDC - 4...20mA	-10T60 °C 10...90% rh	ASPC110000
DPPC112000	sonda di temperatura e umidità per ambiente tecnico con uscita 0...10VDC	-10T60 °C 10...90% rh	
DPPC210000	sonda di temperatura e umidità per ambiente tecnico con uscita 0...1VDC - 4...20mA	-20T70 °C 0...100% rh	ASPC230000 ASPC230010
DPPC211000	sonda di temperatura e umidità (uscita res. NTC) / 0...100% (uscita 0...1 VDC - 4...20 mA)	-20T70 °C	
DPPC212000	sonda di temperatura e umidità per ambiente tecnico con uscita 0...10VDC	-20T70 °C 0...100% rh	
DPPT011000 (*)	sonda di temperatura NTC resistiva	-20T70 °C	ASPT011000

(*) : Per il collegamento elettrico, vedi etichetta riportata sul sensore

Istallazione, montaggio: Nelle figure 1 e 2 sono indicati i punti di fissaggio per le sonde, si consigliano di utilizzare le viti fornite.

Collegamenti :

In fig. 3 sono riportati gli schemi di collegamenti per le connessioni con uscita in tensione o corrente e per NTC resistivo. Avvertenze:
- per mantenere il grado di protezione indicato IP55 il collegamento deve essere realizzato con cavo multipolare con guaina esterna di 8 mm max.
- si consiglia l'uso di cavi schermati. I cavi di segnale non devono essere alloggiati vicino a cavi di alimentazione o di carichi alimentati a 230...400 Vac, ne vicino a cavi di comando di teleruttori. Si riducono i rischi di accoppiamento di disturbi e quindi di errori di misura causati da accoppiamento elettromagnetico.
- è da prevedere un isolamento almeno principale rispetto ad alimentazione di rete per il controllo a cui la sonda è collegata; se il cappuccio sensore è accessibile agli utilizzatori si deve prevedere un doppio isolamento.
- per il cablaggio si consiglia un cavo multipolare da 3 a 5 fili con sezione massima di 1,5mm². Per i modelli con uscita in tensione (-0,5...1V in particolare) é importante valutare la sezione del filo in funzione della lunghezza del collegamento. Alcuni esempi per uscita -0,5...1V:

Lung. (m)	sezione (mm²)	err. (T)	err. (H)
30 m	0,5 mm²	0,9 C	0,9 %rh
30 m	1,5 mm²	0,3 C	0,3 %rh

Per evitare gli errori dovuti alla corrente di alimentazione si può utilizzare una alimentazione supplementare da un trasformatore esterno (fig. 4 cod. trasformatore TRA12VDE00 o TRA2400001). Il trasformatore non deve essere collegato a terra e può essere posizionato nel quadro del regolatore, la connessione di alimentazione utilizza in questo caso due fili separati da quelli di segnale (4 o 5 fili in totale) e si eliminano gli errori in quanto non scorre corrente sulla connessione M. In installazioni con più sonde ognuna deve essere alimentata dal proprio trasformatore, con tale situazione la distanza max di collegamento può essere di 100m (fig. 4). Uscita in corrente 4...20 mA: per distanze superiori a 30 m si consiglia di utilizzare l'uscita in corrente, fino alla distanza massima di 200 m. In caso di alimentazione in alternata delle sonde (24 Vac) è indispensabile utilizzare cavi di sezione 1,5mm² per ridurre il rumore dovute alla connessione di alimentazione, se possibile é da preferire l'alimentazione in continua (12...24 Vdc) oppure l'alimentazione supplementare con trasformatore come in fig. 4.

Caratteristiche tecniche

Alimentazione	12...24 Vac +/-10% o 8...32 Vdc (min-max); 24 Vac o 18...32 Vdc per versioni 0...10V out
Assorbimento	uscita in tensione carico 10kohm, 2 uscite Vout max: 10 mA, 12 Vdc alimentazione; 8 mA, 24 Vdc alimentazione - uscita in corrente, 2 uscite a 20 mA: 35mA, 12 Vdc alimentazione; 24mA, 24 Vdc alimentazione 50mA, 12 Vac alimentazione; 24mA, 24 Vac alimentazione
Campo di lavoro	temperatura -10T60 °C o da -20 °C a +70 °C o Umidità da 00 a 100 %rh o 10...90 %rh Nota: la precisione indicata e' da 10 a 95% rh
Precisione	NTC res. +/-0,3°C a 25°C, +/-0,9°C -20T70 °C Temperatura(*) -0,5/1V, +/-0,5°C a 25°C , +/-0,9°C - 10T60 °C 0...1V +/-0,5°C a 25°C, +/-1°C - 10T60 °C 0...10V +/-0,5°C a 25°C, +/-1°C - 10T60 °C 4...20mA +/-0,5°C a 25°C, +/-1°C - 10T60 °C Umidità(*) -0,5...1V, +/-3%rh a 25°C/50%rh, +/-6%rh -20T70 °C 0...1V, +/-3%rh a 25°C/50%rh, +/-6%rh -20T70 °C 0...10V, +/-3%rh a 25°C/50%rh, +/-6%rh -20T70 °C 4...20mA, +/-3%rh a 25°C/50%rh, +/-6%rh -20T70 °C
Immagazzinamento	-20T70 °C ; 20...90%rh non condensante
Funzionamento limiti	-20T70 °C ; 0...100%rh non condensante
Sensore Temperatura	NTC 10Kohm a 25 °C 1%
Umidità	Sensore Capacitivo
Segnale uscita Temperatura	Range di riferimento -30°C +70°C -0,5...1V 10mV/°C da -0,1 a 0,6V o -0,2 a 0,7V 0...1V 10mV/°C (0V =-30°C 1V=+70°C) 0...10V 100mV/°C (0V =-30°C 10V=+70°C) 4...20mA 0,16mA/°C (4 =-30°C 20mA =+70°C) NTC res. Valore NTC 42,47K a -10°C , 3,02K a 60°C
Segnale uscita Umidità	Range di riferimento 0%rh 100%rh 0...1V o -0,5...1V 10mV/%rh (0V = 0%rh 1V=100%rh) 0...10V 100mV/%rh (0V = 0%rh 10V=100%rh) 4...20mA 0,16mA/%rh (4 = 0%rh 20mA =100%rh)
Morsettiera	morsetti a vite per cavi con sezione da 0,2 a 1,5 mmq
Grado protezione contenitore	IP55
Grado protezione elementi sensibili	IP40/IP55 sinterizzato
Costante di tempo ferma	300 s in aria ferma
Temperatura	60 s in aria ventilata (3m/s)
Costante di tempo Umidita'	60 s in aria ferma 20 s in aria ventilata (3m/s)
Classificazione secondo la protezione contro le scosse elettriche	Integrabili in apparecchiature di classe I e II
PTI dei materiali Isolanti	250V
Periodo delle sollecitazioni elettriche delle parti isolanti	lungo
Grado di inquinamento ambientale	normale
Categoria di resistenza al calore ed al fuoco	categoria D (per scatola e coperchio)
Categoria di immunità contro le sovratensioni	categoria 2

(*): Temperatura/Umidità : possibili variazioni entro ± 2,5 °C e ± 5% rh in presenza di forti campi elettromagnetici (10Vm)
NOTA: Per le uscite 0...1V, 0...10V e 4...20 mA i valori di inizio e fine scala possono differire dalla sonde analogiche serie AS*

Smaltimento del prodotto: Deve essere oggetto di raccolta separata in conformità alle vigenti normative locali in materia di smaltimento.

Avvertenze Importanti: Il prodotto CAREL e' un prodotto tecnologicamente avanzato , il cui funzionamento e'specificato nella documentazione tecnica fornita con il prodotto o scaricabile , anche anteriormente all' acquisto, dal sito Internet www.carel.com . Il cliente (costruttore, progettista o installatore dell' equipaggiamento finale) si assume ogni responsabilità e rischio in relazione alla fase di configurazione del prodotto per il raggiungimento dei risultati previsti in relazione all' installazione e/o equipaggiamento finale specifico. La mancanza di tale fase di studio, che e' richiesta/indicata nel manuale di uso, può generare malfunzionamenti nei prodotti finali di cui CAREL non potrà essere ritenuta responsabile. Il cliente finale deve utilizzare il prodotto solo nelle modalità descritte nella documentazione relativa al prodotto stesso. La responsabilità di CAREL in relazione al proprio prodotto è regolata dalle condizioni generali di contratto CAREL disponibili nel sito www.carel.com e/o da specifici accordi con i clienti.

(GB)

General features

The CAREL DP series electronic probes are designed for air-conditioning and air handling, heating and refrigeration applications, to be used in combination with the corresponding CAREL controllers. Versions are available for rooms, industrial environments and ducts. These differ in terms of assembly, the type of output signal and the models: temperature, humidity or combined. Versions are available with temperature output with resistive NTC. Compared to the AS family, these feature considerable improvements in terms of temperature and humidity measurement precision. The setting of the dipswitches (DP1, 2) is used to select the output signal for connection to CAREL or other controllers, as shown in Fig. 3: Temperature/humidity outputs: **voltage** -0.5V...+1V - 0...1V - 0...10V
current 4...20mA

Both channels are configured in the same way, mixed connections of the outputs are not possible. Some product codes feature direct connection of the NTC temperature sensor, indicated as NTC res. The version with 0...10V outputs is a specific code, and cannot be configured differently (DP1, 2 locked).

DPD* duct probes

Typical applications in ducted heating and air-conditioning systems.

Code	Description	Range	Replaces
DPDT010000	duct temperature probe with 0...1VDC - 4...20mA output	-20T70 °C	ASDT030000
DPDT011000	duct temperature probe (res. NTC output)	-20T70 °C 10...90% rh	
DPDC111000	duct temperature and humidity probe with res. NTC output/ 0...1VDC - 4...20mA output	-10T60 °C 10...90% rh	ASDC111000
DPDC110000	duct temperature and humidity probe with 0...1VDC - 4...20mA output	-10T60 °C 10...90% rh	ASDC110000 ASDH100000
DPDC112000	duct temperature and humidity probe (0...10VDC output) / rh 10 to 90% (0...10VDC output)	-10T60 °C 10...90% rh	
DPDC210000	duct temperature and humidity probe with 0...1VDC - 4...20mA output	-20T70 °C 0...100% rh	ASDC230000 ASDH200000
DPDC211000	duct temperature and humidity probe (res. NTC output) rh 0 to 100% (0...1VDC - 4...20mA output)	-20T70 °C 0...100% rh	
DPDC212000	duct temperature and humidity probe with 0...10V output	-20T70 °C 0...100% rh	
DPDT011000 (*)	temperature probe NTC, resistive	-20T70 °C	ASDT011000

(*) : For the wiring connection, see the label on the sensor

DPP* industrial probes

Special applications (cold stores, pools, . .) .

Code	Description	Range	Replaces
DPPT010000	industrial probe with 0...1VDC - 4...20mA output	-20T70 °C	
DPPT011000	industrial probe (res. NTC output)	-20T70 °C	
DPPC111000	industrial temperature and humidity probe with res. NTC output / 0...1VDC - 4...20mA output	-10T60 °C 10...90% rh	
DPPC110000	industrial temperature and humidity probe with 0...1VDC - 4...20mA output	-10T60 °C 10...90% rh	ASPC110000
DPPC112000	industrial temperature and humidity probe with 0...10VDC output	-10T60 °C 10...90% rh	
DPPC210000	industrial temperature and humidity probe with 0...1VDC - 4...20mA output	-20T70 °C 0...100% rh	ASPC230000 ASPC230010
DPPC211000	temperature and humidity probe °C (res. NTC output)/ 0...100% rH (0...1VDC - 4...20mA output)	-20T70 °C	
DPPC212000	industrial temperature and humidity probe with 0...10VDC output	-20T70 °C 0...100% rh	
DPPT011000 (*)	temperature probe NTC, resistive	-20T70 °C	ASPT011000

(*) : For the wiring connection, see the label on the sensor

Installation, assembly:

- Figures 1 and 2 indicate the fastening points for the probes, the screws supplied should be used.

Connections :

Fig. 3 shows the connection diagrams for voltage or current and resistive NTC output.
Warnings :
- To maintain the index of protection specified (IP55) the connection must be made using multi-core cables with external sheath, max. 8 mm.
- Shielded cables are recommended. The signal cables must never run near power cables or cables to loads powered at 230...400 Vac, nor near cables running to contactors. This reduces the risk of disturbance and consequently measurement errors due to electromagnetic coupling.
- Minimum primary insulation is required from the mains power supply for the controller that the probe is connected to; if the sensor cap is accessible to the users, double insulation is required.
- For the wiring, use a multi-core cable with 3 to 5 wires, with a maximum cross-section of 1.5mm2. For the models with voltage output (-0.5...1V in particular) choose the cross-section of the wires based on the length of the connection. Some examples for -0.5...1V output:

Length (m)	size (mm²)	err. (T)	err. (H)
30 m	0.5 mm²	0.9 C	0.9 %rh
30 m	1.5 mm²	0.3 C	0.3 %rh

To avoid errors due to the supply current, an additional power supply from external transformer can be used (Fig. 4, transformer code TRA12VDE00 or TRA2400001).
The transformer must not be earthed and can be installed in the controller panel, the power supply connection in this case uses two separate wires from the signal wires (4 or 5 wires in total) and errors are eliminated, as no current runs through the M connection. In installations with multiple probes, each must be powered by its own transformer, and in these situations the maximum connection distance is 100 m (Fig. 4). 4...20 mA current output: for distances in excess of 30 m, the current output should be used, up to a maximum distance of 200 m. For alternating current power supply to the probes (24 Vac) it is essential to use 1.5mm2 wires so as to reduce the noise due to the power supply connection, where possible use a DC power supply (12...24 Vdc) or alternatively an additional power supply with transformer as shown in Fig. 4 .

Technical specifications

Power supply	12...24 Vac +/-10% or 8...32 Vdc (min-max); 24 Vac or 18...32 Vdc for 0...10V out versions
Current	voltage output, load 10kohm, 2 outputs at max Vout: 10 mA - 12 Vdc power supply; 8 mA - 24 Vdc power supply current output, 2 outputs at 20 mA : 35mA - 12 Vdc p.s.; 24mA -24 Vdc p.s.; 50mA -12 Vac p.s.; 24mA - 24 Vac p.s.
Operating range	Temperature -10T60 °C or from -20 °C to +70 °C Humidity from 00 to 100 %rh or 10 to 90%rh Note: the precision specified is for 10 to 95% rh
Precision	Res. NTC +/-0.3°C a 25°C, +/-0.9°C -20T70 °C Temperature(*) -0.5...1V +/-0.5°C at 25°C, +/-0.9°C - 10T60 °C 0 to 1V +/-0.5°C at 25°C, +/-1°C - 10T60 °C 0. to 10V +/-0.5°C at 25°C, +/-1°C - 10T60 °C 4 to 20mA +/-0.5°C at 25°C, +/-1°C - 10T60 °C Humidity (*) -0.5 to 1V, +/-3%rh at 25°C/50%rh, +/-6%rh -20T70 °C 0 to 1V, +/-3%rh at 25°C/50%rh, +/-6%rh -20T70 °C 0 to 10V, +/-3%rh at 25°C/50%rh, +/-6%rh -20T70 °C 4 to 20mA, +/-3%rh at 25°C/50%rh, +/-6%rh -20T70 °C
Storage	-20T70 °C ; 20...90%rh non-condensing
Operating limits	-20T70 °C ; 0...100%rh non-condensing
Temperature sensor	NTC 10Kohm at 25 °C 1%
Humidity sensor	Capacitive sensor
Output signal	Range of reference -30°C +70°C
Temperature	-0.5...1V 10mV/°C from -0.1 to 0.6V or from -0.2 to -0.7V 0...1V 10mV/°C (0V =-30°C 1V=+70°C) 0...10V 100mV/°C (0V =-30°C 10V=+70°C) 4...20mA 0.16mA/°C (4 =-30°C 20mA =+70°C) Res. NTC NTC value 42.47K at -10°C , 3.02K at 60°C
Output signal Humidity	Range of reference 0%rh 100%rh 0...1V or -0.5...1V 10mV/°rh (0V = 0%rh 1V=100%rh) 0...10V 100mV/°rh (0V = 0%rh 10V=100%rh) 4...20mA 0.16mA/°rh (4 = 0%rh 20mA =100%rh)
Terminal block	screw terminals for cables with cross-section from 0.2 to 1.5 mm2
Case index of protection	IP55
Sensor index of protection	IP40/IP55 sinterised
Time constant Temperature	300 s in still air 60 s in moving air (3m/s)
Time constant Humidity	60 s in still air 20 s in moving air (3m/s)
Classification according to protection against electric shock	To be integrated into class I and II appliances
PTI of the insulating materials	250V
Period of stress across the insulating parts	long
Environmental pollution	normal
Category of resistance to heat and fire	category D (case and cover)
Category of immunity against voltage surges	category 2

(*): Temperature/humidity : possible variations within ± 2.5 °C and ± 5% rH in the presence of strong electromagnetic fields (10Vm)
NOTE: For the 0 to 1V, 0 to 10V and 4 to 20 mA outputs the start and end scale values may differ from the AS* series analogue probes

Disposal of the product: The appliance (or the product) must be disposed of separately in accordance with the local waste disposal legislation in force.

Important Warnings: The CAREL product is a state-of-the-art product, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com. The client (builder, developer or installer of the final equipment) assumes every responsibility and risk relating to the phase of configuration the product in order to reach the expected results in relation to the specific final installation and/or equipment. The lack of such phase of study, which is requested/indicated in the user manual, can cause the final product to malfunction of which CAREL can not be held responsible. The final client must use the product only in the manner described in the documentation related to the product itself. The liability of CAREL in relation to its own product is regulated by CAREL's general contract conditions edited on the website www.carel.com and/or by specific agreements with clients.

Cablaggio della sonda allo strumento quando è richiesto un trasformatore supplementare esterno / *Connecting the probe to the controller with supplementary transformer (if required)* / Câblage de la sonde à l'instrument quand un transformateur supplémentaire externe est requis / *Anschluss des Fühlers an das Instrument, wenn ein zusätzlicher externer Transformator erforderlich ist* / Cableado de la sonda al instrumento cuando se requiere un transformador suplementario externo

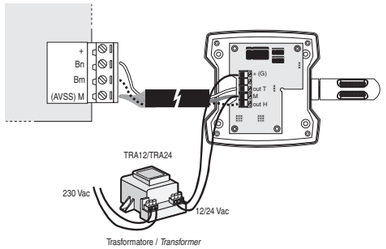


Fig. 4

Esploso del montaggio della sonda/ Probe mounting view / Écladé du montage de la sonde / Explosionszeichnung der Fühlermontage / Vista de montaje de la sonda

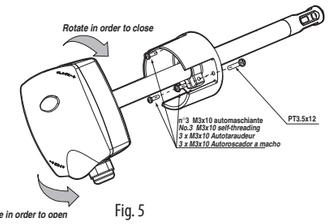
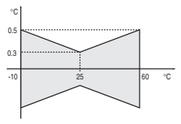
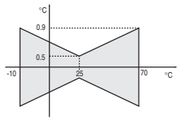


Fig. 5

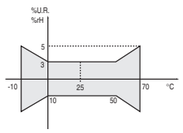
Dipendenza delle'errore dalla temperatura/ *Temperature error dependance*/ Dépendance de l'erreur de la température/*Abhängigkeit des Fehlers von der Temperatur*/ Dependencia del error de la temperatura



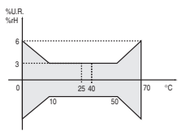
Misura di temp (NTC res.), range -20T70℃
Temp.measurement (NTC energized), range -20T70℃
Mesure de température (NTC rés.), plage -20T70℃
Temperaturmessung (NTC res.), Bereich -20T70℃
Medición de temperatura (NTC res.) gama -20T70℃



Misura di temperatura (PT1000 attiva), range -20T70 ℃
Temp.measurement (PT1000 active), range -20T70℃
Mesure de température (PT1000 active), plage -20T70 ℃
Temperaturmessung (PT100 aktiv), Bereich -20T70 ℃
Medición de temperatura (Pt1000) gama -20T70℃



Misura di umidità, range 0...100%U.R., -10...70°C
Da 60°C a 70°C l'errore può aumentare nel tempo sopra il 70%U.R.Temp.
Humidity measurement, range -10...70%°C
From 60°C to 70°C the error may increase in time above 70%rH
Mesure d'humidité, gamme 0-100%H.R., -10T70°C
De 60°C à 70°C l'erreur peut augmenter dans le temps dépassant 70% d'H.R.
Feuchtewert, Bereich -10...70%°C
Zwischen 60°C und 70°C kann der Fehler steigen, wenn 70%rF überschritten werden.
Medición de humedad, gama 0...100%H.R., -10T70°C
De 60°C a 70°C el error puede aumentar en el tiempo por arriba del 70% de H.R.



Misura di umidità, range 10-90%U.R., 0-50°C
Humidity measurement, range 0-50°C
Mesure d'humidité, gamme 10-90%H.R., 0T50°C
Feuchtewert, Bereich 0T50°C
Medición de humedad, gama 10-90%H.R., 0T50°C

Fig. 6

Avvertenze per la sostituzione delle serie ASD ASP

Le connessioni elettriche sono perfettamente compatibili. Si deve verificare la specifica di alimentazione in particolare per le versioni con uscita 0...10V che richiedono un tensione minima maggiore di 12 Vac/dc.

Warnings for replacing the ASD ASP series

The electrical connections are completely compatible. Check the specifications of the power supply, in particular for the versions with 0-10V output, which require a minimum voltage greater than 12 Vac/dc.

Avvertenze per la sostituzione delle serie ASWxxx

Le dimensioni esterne ed i fissaggi sono perfettamente compatibili con quelli della precedente famiglia ASWxxx.
Per l'effettivo utilizzo e' necessario disporre di un controllo che le preveda come connessione-gestione dell'interfaccia seriale. Per le uscite 0...1V 0...10V e 4...20 mA i valori di inizio e fine scala possono differire dalla sonde analogiche serie AS*

Warnings for replacing the ASWxxx series

The external dimensions and the attachments are perfectly compatible with the previous ASWxxx family. For effective operation a controller must be used that features this as the connection-management of the serial interface.
For the 0 to 1V, 0 to 10V and 4 to 20 mA outputs the start and end scale values may differ from the AS* series analogue probes

F

Caractéristiques générales

Les sondes électroniques CAREL série DP sont des dispositifs pour applications dans les secteurs du conditionnement et traitement de l'air, chauffage et régrigération, en combinaison avec les contrôles CAREL. Sont disponibles les versions pour milieu, milieu technique et pour conduite. Elles se différencient pour le montage, le type de sortie de signal et pour les modèles: température, humidité ou combinés. Il existe également des versions avec sortie de température avec NTC résistif. Par rapport à la gamme AS elles présentent de considérables améliorations quant à la précision de mesure de température et humidité.

La configuration des dip-switch (DP1, 2) permet de sélectionner le signal de sortie pour la connexion aux contrôles CAREL ou autres, comme indiqué sur la fig. 3 : Sorties Température/Humidité

sous tension -0,5V...+1V 0...1V 0...10V
en courant 4...20mA

Les deux canaux se configurent de la même façon, il n'est pas possible d'effectuer des connexions mixtes des sorties. Certains codes prévoient la connexion directe du senseur de température NTC, indiquée comme NTC rés. La version avec sorties 0...10V est un code spécifi que non confi gurable différent de 0...10 V (DP1, 2 sont bloqués).

Sondes pour conduite DPD*

Utilisation en installations de chauffage et conditionnement qui utilisent des conduites.

Code	Description	Plage	Remplace
DPDT010000	sonde de température pour conduite avec sortie 0...1VDC - 4...20mA	-20T70 ℃	ASDT030000
DPDT011000	sonde de température pour conduite (sortie rés. NTC)	-10T60 ℃ 10...90% rh	
DPDC111000	sonde de température et humidité pour conduite avec sortie NTC rés./ sortie 0...1VDC, 4...20mA	-10T60 ℃ 10...90% rh	ASDC111000
DPDC110000	sonde de température et humidité pour conduite avec sortie 0...1VDC, 4...20mA	-10T60 ℃ 10...90% rh	ASDC110000 ASDH100000
DPDC112000	sonde de température et humidité pour conduite (sortie 0...10VDC) / rh 10...90% (sortie 0...10VDC)	-20T70 ℃ 10...90% rh	
DPDC210000	sonde de température et humidité pour conduite avec sortie 0...1VDC - 4...20mA / rh sortie 0...1VDC - 4...20mA	-20T70 ℃ 0...100% rh	ASDC230000 ASDH200000
DPDC211000	sonde de température et humidité pour conduite (sortie rés. NTC) rh 0...100% (sortie 0≠1 UDC- 4...20mA)	-20T70 ℃ 0...100% rh	
DPDC212000	sonde de température et humidité pour conduite 0...10V / sortie 0...10VDC	-20T70 ℃ 0...100% rh	
DPDT011000 (*)	sonde de température NTC résistive	-20T70 ℃	ASDT011000

(*) : Pour le branchement, voir étiquette sur la sonde

Sondes pour milieu technnique DPP*

Utilisation en installations techniques (cellulés de conservation, piscines, . . .)

Code	Description	Plage	Remplace
DPPT010000	sonde pour milieu technique avec sortie 0...1VDC – 4...20mA	-20T70 ℃	
DPPT011000	sonde pour milieu technique (sortie rés. NTC)	-20T70 ℃	
DPPC111000	sonde de température et humidité pour milieu technique avec sortie rés. NTC / 0...1VDC - 4...20mA	-10T60 ℃ 10...90% rh	
DPPC110000	sonde de température et humidité pour milieu technique avec sortie 0...1VDC - 4...20mA	-10T60 ℃ 10...90% rh	ASPC110000
DPPC112000	sonde de température et humidité pour milieu technique avec sortie 0...10VDC	-10T60 ℃ 10...90% rh	
DPPC210000	sonde de température et humidité pour milieu technique avec sortie 0...1VDC - 4...20mA	-20T70 ℃ 0...100% rh	ASPC230000 ASPC230I0
DPPC211000	sonde de température et humidité (sortie rés. NTC) / 0-100% (sortie 0...1 VDC - 4...20 mA)	-20T70 ℃	
DPPC212000	sonde de température et humidité pour milieu technique avec sortie 0...10VDC	-20T70 ℃ 0...100% rh	
DPPT011000 (*)	sonde de température NTC résistive	-20T70 ℃	ASPT011000

(*) : Pour le branchement, voir étiquette sur la sonde

Installation, montage:

- Les figures 1 et 2 indiquent les points de fixation pour les sondes, nous conseillons d'utiliser les vis fournies.

Branchements :

La fig. 3 reprend les schémas de branchements pour les connexions avec sortie sous tension ou courant et pour NTC résistif.
Attention:
- pour conserver le degré de protection indiqué IP55 le branchement doit être réalisé avec câble multipolaire avec gaine externe de 8 mm max.
- nous consellons d'utiliser des câbles blindés. Les câbles de signal ne doivent pas être logés à proximité des câbles d'alimentation ou de charges alimentés à 230...400 Vac, ni à proximité des câbles de commande de télérupteurs. Ceci permet de réduire les risques d'accoupplement d'interférences et donc des erreurs de mesure provoquées par accoupplement électromagnétique.
- Il faut prévoir une isolation au moins principale par rapport à l'alimentation de réseau pour le contrôle auquel la sonde est branchée; si les utilisateurs peuvent avoir accès au capuchon senseur, il faut prévoir une double isolation.
- quant au câblage nous conseillons un câble multipolaire de 3 à 5 fi ls avec section maxima de 1,5mm². Pour les modèles avec sortie sous tension (-0,5...1V en particuliers) il est important d'évaluer la section du fi l en fonction de la longueur du branchement. Quelques exemples pour sortie -0,5...1V :

Long. (m)	section (mm²)	err. (T)	err. (H)
30 m	0,5 mm²	0,9 C	0,9 %hr
30 m	1,5 mm²	0,3 C	0,3 %hr

Pour éviter les erreurs dues au courant d'alimentation, vous pouvez utiliser une alimentation supplémentaire par un transformateur externe (fig. 4 code transformateur TRA12VDE00 ou TRA2400001). Le transformateur ne doit pas être relié à la terre et peut être situé dans le tableau du régulateur, dans ce cas la connexion d'alimentation utilise deux fi ls séparés de ceux de signal (4 ou 5 fi ls au total) et les erreurs sont ainsi éliminées puisqu'il n'y a pas de courant sur la connexion M. Dans les installations avec plusieurs sondes, chacune doit être alimentée par son propre transformateur, dans ce cas la distance max de branchement peut être de 100m (fig. 4). Sortie en courant 4...20 mA: dans le cas de distances supérieures à 30 m, nous consellons d'utiliser la sortie en courant, jusqu'à la distance maxima de 200 m. Dans le cas d'alimentation par courant alternatif des sondes (24 Vac) il faut utiliser des câbles de section 1,5mm2 pour réduire le bruit dû à la connexion d'alimentation, si possible, il faut utiliser de préférence l'alimentation par courant continu (12...24 Vdc) ou bien l'alimentation supplémentaire avec transformateur comme sur fig. 4.

Caractéristiques techniques

Alimentation	12...24 Vac +/-10% ou 8...32 Vdc (min-max); 24 Vac ou 18...32 Vdc pour versions 0...10V out	
Absorption	sortie sous tension charge 10kohm, 2 sorties Vout max: 10 mA, 12 Vdc alimentation; 8 mA, 24 Vdc alimentation - sortie en courant, 2 sortie à 20 mA: 35mA, 12 Vdc alimentation; 24mA, 24 Vdc alimentation 50mA, 12 Vac alimentation; 24mA, 24 Vac alimentation	
Champ de travail	température Humidité Note: la précision indiquée est de 10 à 95% rh	-10T60 ℃ ou de -20 ℃ à +70 ℃ de 00 à 100 % rh ou 10 à 90 % rh
Précision	NTC rés. Température(*) 0...1V 0...10V 4...20mA Humidité (*)	+/-0,3°C à 25°C , +/-0,9°C - 20T70 ℃ -0,5/1V, +/-0,5°C a 25°C , +/-0,9°C - 10T60 ℃ +/-0,5°C à 25°C , +/-1°C - 10T60 ℃ +/-0,5°C à 25°C , +/-1°C - 10T60 ℃ +/-0,5°C à 25°C , +/-1°C - 10T60 ℃ -0,5...1V, +/-3%rh à 25°C/50%rh, +/-6%rh -20T70 ℃ 0...1V, +/-3%rh à 25°C/50%rh, +/-6%rh -20T70 ℃ 0...10V, +/-3%rh à 25°C/50%rh, +/-6%rh -20T70 ℃ 4...20mA, +/-3%rh à 25°C/50%rh, +/-6%rh -20T70 ℃
Stockage	-20T70 ℃ ; 20...90%rh non condensante	
Fonctionnement limites	-20T70 ℃ ; 0...100%rh non condensante	
Senseur Température Humidité	NTC 10Kohm a 25 ℃ 1% Senseur Capacitif	
Signal sortie Température	Plage de référence -30℃ +70℃ -0,5...1V 0...1V 0...10V 4...20mA NTC rés.	10mV/℃ da -0,1 à 0,6V ou da -0,2 à 0,7V 10mV/℃ (0V =-30℃ 1V=+70℃) 100mV/℃ (0V =-30℃ 10V=+70℃) 0,16mA/℃ (4 =-30℃ 20mA =+70℃) Valeur NTC 42,47K à -10℃ , 3,02K à 60℃
Signal sortie Humidité	Range di riferimento 0%rh 100%rh -0,5...1V 0...1V 0...10V 4...20mA	10mV/%rh de 0,0 à 1,0V 10mV/%rh (0V = 0%rh 1V=100%rh) 100mV/%rh (0V = 0%rh 10V=100%rh) 0,16mA/%rh (4 = 0%rh 20mA =100%rh)
Barrette de raccordement	bornes à vis pour câbles avec section de 0,2 à 1,5 mmq	
Degré protection conteneur	IP55	
Degré protection éléments sensibles	IP40/IP55 fritté	
Constante de temps immobilité Température	300 s en air immobile 60 s en air ventilé (3m/s)	
Constante de temps Humidité	60 s en air immobile 20 s en air ventilé (3m/s)	
Classifi cation selon la protection contre les décharges électriques	Intégrables à des appareils de classe I et II	
PTI des matériels Isolants	250V	
Période des sollicitations électriques des parties isolantes	longue	
Degré de pollution ambiante	normal	
Catégorie de résistance à la chaleur et au feu	catégorie D (pour boîte et couvercle)	
Catégorie d'immunité contre les surtensions	catégorie 2	

(*): Température/Humidité: possibles variations entre ± 2,5 °C et ± 5% rh en présence de champs électromagnétiques importants (10Vm)
NOTE: Pour les sorties 0...1V, 0-10V et 4...20 mA les valeurs de début et de fin échelle peuvent différer des sondes analogiques série AS*

D

Allgemeine Beschreibung

Die elektronischen CAREL-Fühler der Serie DP wurden für Anwendungen in der Klima-, Kälte-, Heiz- und Lüftungstechnik in kombiniertem Einsatz mit den CAREL-Steuerungen entwickelt. Sie sind in den Versionen für Räume, technische Installationen und Luftkanäle verfügbar und unterscheiden sich nach Montagetechnik, Signalausgang und Modell: Temperaturfühler, Feuchtefühler oder kombinierte Fühler. Außerdem werden NTC-Versionen (ohmsche NTC-Temperaturfühler) angeboten. Im Vergleich zur AS-Produktbandreihe wurden sie in ihrer Temperatur- und Feuchtemessgenauigkeit stark optimiert. Die Konfiguration der Dip-Schalter (DP1, 2) lässt das Ausgangssignal für den Anschluss an die Steuerungen von CAREL oder anderer Hersteller wählen (siehe Fig. 3): Temperatur-/Feuchteausgang

Spannungssignal -0,5V...+1V 0...1V 0...10V

Stromsignal 4...20mA

Beide Kanäle werden auf dieselbe Weise konfiguriert; gemischte Anschlüsse der Ausgänge sind nicht möglich. Einige Modelle sehen den direkten Anschluss des NTC-Temperaturfühlers (NTC ohmsch) vor. Die Version mit 0...10 V-Ausgängen muss als 0...10 V konfiguriert werden (DP1, 2 sind gesperrt).

Luftkanalfühler DPD*

Sie werden in Heiz- und Klimaanlagen mit Luftkanälen eingesetzt.

Code	Beschreibung	Messbereich	Ersetzt:
DPDT010000	Luftkanal-Temperaturfühler mit Ausgang 0...1VDC - 4...20mA	-20T70 ℃	ASDT030000
DPDT011000	Luftkanal-Temperaturfühler (Ausgang NTC ohmsch)	-20T70 ℃ 10...90% rF	
DPDC111000	Luftkanal-Temperatur- und Feuchtefühler mit Ausgang NTC ohmsch/Ausgang 0...1VDC, 4...20mA	-10T60 ℃ 10...90% rF	ASDC111000
DPDC110000	Luftkanal-Temperatur- und Feuchtefühler mit Ausgang 0...1VDC, 4...20mA	-10T60 ℃ 10...90% rF	ASDC110000 ASDH100000
DPDC112000	Luftkanal-Temperatur- und Feuchtefühler (Ausgang 0...10VDC) / rF 10...90% (Ausgang 0...10VDC)	-10T60 ℃ 10...90% rF	
DPDC210000	Luftkanal-Temperatur- und Feuchtefühler mit Ausgang 0...1VDC - 4...20mA / rF Ausgang 0...1VDC - 4...20mA	-20T70 ℃ 0...100% rF	ASDC230000 ASDH200000
DPDC211000	Luftkanal-Temperatur- und Feuchtefühler (Ausgang NTC ohmsch) rF 0...100% (Ausgang 0≠1 UDC- 4...20mA)	-20T70 ℃ 0...100% rF	
DPDC212000	Luftkanal-Temperatur- und Feuchtefühler 0...10V / Ausgang 0...10VDC	-20T70 ℃ 0...100% rF	
DPDT011000 (*)	Temperaturfühler NTC ohmsch	-20T70 ℃	ASDT011000

(*) : Für die Elektroanschlüsse siehe Etikettendaten des Fühlers

Fühler für technische Installationen DPP*

Sie werden in technischen Installationen (Konservierungsräume, Schwimmbäder, ...) eingesetzt.

Code	Beschreibung	Messbereich	Ersetzt:
DPPT010000	Fühler für technische Installationen mit Ausgang 0...1VDC - 4...20mA	-20T70 ℃	
DPPT011000	Fühler für technische Installationen (Ausgang NTC ohmsch)	-20T70 ℃	
DPPC111000	Temperatur- und Feuchtefühler für technische Installationen mit Ausgang NTC ohmsch / 0...1VDC - 4...20mA	-10T60 ℃ 10...90% rF	
DPPC110000	Temperatur- und Feuchtefühler für technische Installationen mit Ausgang 0...1VDC - 4...20mA	-10T60 ℃ 10...90% rF	ASPC110000
DPPC112000	Temperatur- und Feuchtefühler für technische Installationen mit Ausgang 0...10VDC	-10T60 ℃ 10...90% rF	
DPPC210000	Temperatur- und Feuchtefühler für technische Installationen mit Ausgang 0...1VDC - 4...20mA	-20T70 ℃ 0...100% rF	ASPC230000 ASPC230I0
DPPC211000	Temperatur- und Feuchtefühler (Ausgang NTC ohmsch)/ 0-100% (Ausgang 0...1 VDC - 4...20 mA)	-20T70 ℃	
DPPC212000	Temperatur- und Feuchtefühler für technische Installationen mit Ausgang 0...10VDC	-20T70 ℃ 0...100% rF	
DPPT011000 (*)	Temperaturfühler NTC ohmsch	-20T70 ℃	ASPT011000

(*) : Für die Elektroanschlüsse siehe Etikettendaten des Fühlers

Installation und Montage:

- In Fig. 1 und 2 sind die Befestigungspositionen für die Fühler angegeben; es empfiehlt sich die Verwendung der im Lieferumfang enthaltenen Schrauben.

Anschlüsse:

In Fig. 3 sind die Anschlusspläne für die Anschlüsse mit Spannungs- oder Stromausgang und für ohmsche NTC-Fühler enthalten.
Hinweise:
- Zur Beibehaltung der Schutzart IP55 muss der Anschluss mit Mehrleiterkabel mit Außenmantel von max. 8 mm ausgeführt werden.
- Es empfiehlt sich die Verwendung von abgeschirmten Kabeln. Die Signalkabel dürfen nicht in der Nähe von Versorgungs- oder 230...400 Vac-Lastkabeln oder Fernschalterkabeln installiert werden. Damit werden Störungskopplungsrisiken und somit Messfehler aufgrund von elektromagnetischer Kopplung reduziert.
- Für die Steuerung, an die der Fühler angeschlossen ist, muss mindestens eine Grundisolierung zur Netzversorgung vorgesehen werden.
- Für die Verdrahtung wird ein Mehrleiterkabel mit 3 bis 5 Leitern mit max. Querschnitt von 1,5 mm² empfohlen. Für die Modelle mit Spannungsausgang (insbesondere -0,5...1V) ist der Querschnitt des Leiters nach der Anschlusslänge zu wählen. Einige Beispiele für den -0,5...1V-Ausgang:

Länge (m)	Querschnitt (mm2)	Fehler(T)	Fehler(H)
30 m	0,5 mm²	0,9 C	0,9 %rF
30 m	1,5 mm²	0,3 C	0,3 %rF

Zur Vermeidung von Versorgungsstromfehlern kann eine zusätzliche Versorgung über einen externen Transformator verwendet werden (Fig. 4 Transformatorcode TRA12VDE00 oder TRA2400001). Der Transformator darf nicht geerdet sein und kann in der Schalttafel der Steuerung positioniert werden; der Versorgungsanschluss sieht in diesem Fall zwei von den Signalleitern getrennte Leiter (4 oder 5 Leiter insgesamt) vor, damit werden Störungen vermieden, da kein Strom auf der M Verbindung fließt. In Installationen mit mehreren Fühlern muss jeder Fühler über seinen eigenen Transformator versorgt werden; dabei beträgt die max. Anschlusslänge 100 mm (Fig. 4). Stromausgang 4...20 mA: Für Abstände über 30 m empfiehlt sich die Verwendung des Stromausgangs bis zu einem max. Abstand von 200 m. Im Fall der Wechselspannungsversorgung der Fühler (24 Vac) müssen Kabel mit 1,5 mm² Querschnitt verwendet werden, um die Geräuschentwicklungen aufgrund des Versorgungsanschlusses zu reduzieren; bei Möglichkeit ist eine Gleichspannungsversorgung (12...24 Vdc) oder eine zusätzliche Versorgung mit Transformator wie in Fig. 4 vorzuziehen.

Technische Daten

Spannungsversorgung	12...24 Vac +/-10% o 8...32 Vdc (min.-max.); 24 Vac oder 18...32 Vdc für Versionen mit 0...10V-Ausgang	
Leistungsaufnahme	Spannungsausgang Last 10kohm, 2 Ausgänge Vout max: 10 mA, 12 Vdc Versorgung; 8 mA, 24 Vdc Versorgung - Stromausgang, 2 20 mA-Ausgänge: 35mA, 12 Vdc Versorgung; 24mA, 24 Vdc Versorgung 50mA, 12 Vac Versorgung; 24mA, 24 Vac Versorgung	
Arbeitsbereich	Temperatur Feuchte N.B.: Die angegebene Genauigkeit beträgt 10 bis 95% rF	-10T60 ℃ und von -20 ℃ bis +70 ℃ von 00 bis 100 % rF und 10 bis 90% rF
Genauigkeit	NTC ohmsch Temperatur (*) 0...1V 0...10V 4...20mA Feuchte (*)	+/-0,3°C bei 25°C , +/-0,9°C - 20T70 ℃ -0,5/1V, +/-0,5°C bei 25°C , +/-0,9°C - 10T60 ℃ +/-0,5°C bei 25°C , +/-1°C - 10T60 ℃ +/-0,5°C bei 25°C , +/-1°C - 10T60 ℃ +/-0,5°C bei 25°C , +/-1°C - 10T60 ℃ -0,5...1V, +/-3% rF bei 25°C/50% rF, +/-6% rF - 20T70 ℃ 0...1V, +/-3% rF bei 25°C/50% rF, +/-6% rF -20T70 ℃ 0...10V, +/-3% rF bei 25°C/50% rF, +/-6% rF -20T70 ℃ 4...20mA, +/-3% rF bei 25°C/50% rF, +/-6% rF -20T70 ℃
Lagerung	-20T70 ℃ ; 20...90% rF nicht kondensierend	
Betriebsgrenzwerte	-20T70 ℃ ; 20...90% rF nicht kondensierend	
Temperaturfühler Feuchtefühler	NTC 10Kohm bei 25 ℃ 1% Kapazitiver Fühler	
Ausgangssignal Temperatur	Bezugsbereich -30℃ +70℃ -0,5...1V 0...1V 0...10V 4...20mA NTC ohmsch	10mV/℃ von -0,1 bis 0,6V und von -0,2V bis 0,7V 10mV/℃ (0V =-30℃ 1V=+70℃) 100mV/℃ (0V =-30℃ 10V=+70℃) 0,16mA/℃ (4 =-30℃ 20mA =+70℃) Wert NTC 42,47K bei -10℃ , 3,02K bei 60℃
Ausgangssignal Feuchte	Bezugsbereich 0% rF 100% rF -0,5...1V 0...1V 0...10V 4...20mA	10mV/%rh von 0,0 bis 1,0V 10mV/%rh (0V = 0% rF 1V=100% rF) 100mV/%rh (0V = 0% rF 10V=100% rF) 0,16mA/%rh(4 = 0% rF 20mA =100% rF)
Klemmleiste	Schraubenklemmen für Kabel von 0,2 bis 1,5 mm² Querschnitt	
Schutzart des Gehäuses	IP55	
Schutzart der Fühler	IP40/IP55 gesintert	
Zeitkonstante Temperatur	300 s in stillstehender Luft 60 s in ventilierter Luft (3m/s)	
Zeitkonstante Feuchte	60 s in stillstehender Luft 20 s in ventilierter Luft (3m/s)	
Schutzklasse gegen Stromschläge	Integrierbar in Geräte der Klasse I und II	
PTI der Isoliermaterialien	250V	
Isolation gegen elektrische Beanspruchung	Lang	
Umweltbelastung	Normal	
Wärme- und Brandschutzkategorie	Kategorie D (für Gehäuse und Abdeckung)	
Schutz gegen Überspannung	Kategorie 2	

(*): Temperatur/Feuchte: Mögliche Schwankungen zwischen ± 2,5 °C und ± 5% rF bei starken, elektromagnetischen Feldern (10Vm).
N.B.: Für die 0...1V-, 0-10V- und 4...20 mA-Ausgänge können die unteren und oberen Endwerte von den analogen Fühlern der Serie AS* abweichen.

ES

Características generales

Las sondas electrónicas CAREL serie DP son dispositivos para aplicaciones en los sectores de acondicionamiento y tratamiento del aire, calefacción y refrigeración, en combinación con los controladores CAREL correspondientes. Hay disponibles versiones para ambiente, ambiente técnico y conducto. Se diferencian por el montaje, por el tipo de salida de la señal y por los modelos: temperatura, humedad o combinadas. También hay disponibles versiones con salida de temperatura con NTC resistivo. Respecto a la familia AS presentan notables mejoras en la precisión de la medida de temperatura y humedad. La configuración de los dip-switch (DP1, 2) permite la selección de la señal de salida para la conexión a controladores CAREL u otros, como se indica en la fig. 3: Salidas Temperatura/Humedad

en tensión -0,5 V...+1 V 0...1 V 0...10 V
en corriente 4...20 mA

Ambos canales se configuran del mismo modo, no es posible realizar conexiones mixtas en las salidas. Algunos códigos prevén la conexión directa del sensor de temperatura NTC, indicada como NTC res. La versión con salidas 0...10V tiene un código específico no configurable distinto de 0...10 V (DP1, 2 están bloqueados).

Sondas para conducto DPD*

Utilizadas en instalaciones de calefacción y acondicionamiento de aire que utilizan conductos.

Código	Descripción	Rango	Sustituye a
DPDT010000	sonda de temperatura para conducto con salida 0...1 VCC - 4...20 mA	-20T70 ℃	ASDT030000
DPDT011000	sonda de temperatura para conducto (salida res. NTC)	-20T70 ℃ 10...90% hr	
DPDC111000	sonda de temperatura y humedad para conducto con salida NTC res./ salida 0...1 VCC, 4...20 mA	-10T60 ℃ 10...90% hr	ASDC111000
DPDC110000	sonda de temperatura y humedad para conducto con salida 0...1 VCC, 4...20 mA	-10T60 ℃ 10...90% hr	ASDC110000 ASDH100000
DPDC112000	sonda de temperatura y humedad para conducto (salida 0...10 VCC) / hr 10...90% (salida 0...10 VCC)	-10T60 ℃ 10...90% hr	
DPDC210000	sonda de temperatura y humedad para conducto con salida 0...1 VCC - 4...20 mA / hr salida 0...1 VCC - 4...20 mA	-20T70 ℃ 0...100% hr	ASDC230000 ASDH200000
DPDC211000	sonda de temperatura y humedad para cond. (salida res. NTC) hr 0...100% (salida 0≠1 UDC- 4...20 mA)	-20T70 ℃ 0...100% hr	
DPDC212000	sonda de temperatura y humedad para conducto 0...10V / salida 0...10 VCC	-20T70 ℃ 0...100% hr	
DPDT011000 (*)	sonda de temperatura NTC resistiva	-20T70 ℃	ASDT011000

(*) : Para la conexión eléctrica, ve etiqueta sobre el sensor

Sondas para ambiente técnico DPP*

Utilizadas en instalaciones técnicas (cámaras de conservación, piscinas, . . .)

Código	Descripción	Rango	Sustituye a
DPPT010000	sonda para ambiente técnico con salida 0...1VCC – 4...20 mA	-20T70 ℃	
DPPT011000	sonda para ambiente técnico (salida res. NTC)	-20T70 ℃	
DPPC111000	sonda de temperatura y humedad para ambiente técnico con salida res. NTC / 0...1VCC - 4...20 mA	-10T60 ℃ 10...90% hr	
DPPC110000	sonda de temperatura y humedad para ambiente técnico con salida 0...1 VCC - 4...20 mA	-10T60 ℃ 10...90% hr	ASPC110000
DPPC112000	sonda de temperatura y humedad para ambiente técnico con salida 0...10 VCC	-10T60 ℃ 10...90% hr	
DPPC210000	sonda de temperatura y humedad para ambiente técnico con salida 0...1 VCC - 4...20 mA	-20T70 ℃ 0...100% hr	ASPC230000 ASPC230I0
DPPC211000	sonda de temperatura y humedad (salida res. NTC)/ 0-100% (salida 0...1 VCC- 4...20 mA)	-20T70 ℃	
DPPC212000	sonda de temperatura y humedad para ambiente técnico con salida 0...10 VCC	-20T70 ℃ 0...100% hr	
DPPT011000 (*)	sonda de temperatura NTC resistiva	-20T70 ℃	ASPT011000

(*) : Para la conexión eléctrica, ve etiqueta sobre el sensor

Instalación, montaje: En las figuras 1 y 2 se indican los puntos de fijación para las sondas, se aconseja utilizar los tornillos suministrados.

Conexiones:

En la fig. 3 se muestran los esquemas para las conexiones con salida en tensión o corriente y para NTC resistivo.
Advertencias:
- para mantener el grado de protección indicado IP55 la conexión debe ser realizada con cable multipolar con vaina externa de 8 mm máx.
- se aconseja el uso de cables apantallados. Los cables de señal no deben ser alojados cerca de cables de alimentación o de cargas alimentadas a 230...400 Vca, ni cerca de cables de maniobra de teleruptores. Se reducen los riesgos de acoplamiento de interferencias y los errores de medida causados por el acoplamiento electromagnético.
- Se debe prever un aislamiento por lo menos principal respecto a la alimentación de red para el controlador al que se conecta la sonda; si el capuchón sensor es accesible a los usuarios se debe prever un aislamiento doble.
- para el cableado se aconseja un cable multipolar de 3 a 5 hilos con sección máxima de 1,5 mm². Para los modelos con salida en tensión (-0,5...1 V en particular) es importante calcular la sección del hilo en función de la longitud de la conexión. Algunos ejemplos para salida -0,5...1V:

Long. (m)	sección (mm²)	err. (T)	err. (H)
30 m	0,5 mm²	0,9 C	0,9 %hr
30 m	1,5 mm²	0,3 C	0,3 %hr

Para evitar los errores debidos a la corriente de alimentación se puede utilizar una alimentación suplementaria desde un transformador externo (fig. 4 cod. transformador TRA12VDE00 o TRA2400001). El transformador no debe estar conectado a tierra y puede estar ubicado en el cuadro del regulador, la conexión de alimentación utiliza en este caso dos hilos separados de los de señal (4 o 5 hilos en total) y se eliminan los errores al no pasar corriente por la conexión M. En instalaciones con más sondas cada una debe ser alimentada desde el propio transformador, en dicha situación la distancia máx. de conexión puede ser de 100m (fig. 4). Salida en corriente 4...20 mA: para distancias superiores a 30 m se aconseja utilizar la salida en corriente, hasta la distancia máxima de 200 m. En caso de alimentación alterna de las sondas (24 Vca) es indispensable utilizar cables de sección 1,5 mm² para reducir el ruido debido a la conexión de alimentación, si es posible, es preferible la alimentación en continua (12...24 Vcc) o la alimentación suplementaria con transformador, como en la fig. 4 .

Características técnicas

Alimentación	12...24 Vca +/-10% o 8...32 Vcc (min-max); 24 Vca o 18...32 Vcc para versiones 0...10V salida	
Consumo	salida en tensión carga 10 kohm, 2 salidas Vout max: 10 mA, 12 Vcc alimentación; 8 mA, 24 Vcc alimentación - salida en corriente, 2 salidas a 20 mA: 35mA, 12 Vcc alimentación; 24mA, 24 Vcc alimentación 50mA, 12 Vca alimentación; 24mA, 24 Vca alimentación	
Campo de trabajo	temperatura Humedad Nota: la precisión indicada es desde 10 hasta 95% hr	-10T60 ℃ o desde -20 ℃ hasta +70 ℃ desde 00 hasta 100 %hr o 10 hasta 90 %hr
Precisión	NTC res. Temperatura(*) 0...1V 0...10V 4...20mA Humedad (*)	+/-0,3°C a 25°C , +/-0,9°C - 20T70 ℃ -0,5/1V, +/-0,5°C a 25°C , +/-0,9°C - 10T60 ℃ +/-0,5°C a 25°C , +/-1°C - 10T60 ℃ +/-0,5°C a 25°C , +/-1°C - 10T60 ℃ +/-0,5°C a 25°C , +/-1°C - 10T60 ℃ -0,5...1V, +/-3%hr a 25°C/50%hr, +/-6%hr -20T70 ℃ 0...1V, +/-3%hr a 25°C/50%hr, +/-6%hr -20T70 ℃ 0...10V, +/-3%hr a 25°C/50%hr, +/-6%hr -20T70 ℃ 4...20mA, +/-3%hr a 25°C/50%hr, +/-6%hr -20T70 ℃
Almacenaje	-20T70 ℃ ; 20...90%hr sin condensación	
Límites de funcionamiento	-20T70 ℃ ; 0...100%hr sin condensación	
Sensor Temperatura Humedad	NTC 10Kohm a 25 ℃ 1% Sensor Capacitivo	
Señal salida Temperatura	Rango de referencia -30℃ +70℃ -0,5...1V 0...1V 0...10V 4...20mA NTC res.	10mV/℃ desde -0,1 a 0,6V o desde -0,1 a 0,7V 10mV/